

# Food Technology Abstracts

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National Information Centre  
for Food Science and Technology,  
Central Food Technological  
Research Institute, Mysore

NISSAT  
Department of  
Science and Technology





# Food Technology Abstracts

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THE EDITORIAL BOARD OF THE JOURNAL OF FOOD SCIENCE AND TECHNOLOGY, LONDON, ENGLAND, HAS THE HONOUR TO ANNOUNCE THE FOLLOWING CONTENTS OF THE JOURNAL FOR THE YEAR 1973.

THE JOURNAL OF FOOD SCIENCE AND TECHNOLOGY, LONDON, ENGLAND, IS A MONTHLY JOURNAL OF THE INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY, SECTION OF FOOD CHEMISTRY.



## GENERAL

- 31 GHOSH (KG), KRISHNAPPA (KG), SRIVATSA (AN), EAPEN (KC) and VIJAYARAGHAVAN (PK). Pilot plant production of thermostabilized ready-to-eat pouch foods. *Res. Ind.* 25(3); 1980; 140-5

A pilot plant scheme for the production of 3 types of Indian dishes ((i) Kheer prepared from whole milk (fresh), Basmati rice, sugar and cardamom by the conventional method and thickened to a solids content of 45%, (ii) Suji halwa, prepared from suji (wheat semolina), sugar, hydrogenated oil, nuts (Chiranjee) and cardamom, by the conventional method; and (iii) mutton kofta curry, prepared from mutton, besan, onion, garlic, ginger fresh, chilli powder, tomato, garam masala and hydrogenated oil, by the conventional method) thermo-stabilized in flexible pouches has been described. The fried mutton balls and gravy separately prepared as two components are packed as a single product and packed in 250 g (MST cellophane (300 grade pouch 18 $\times$ 18 cm) and after suitable manipulation are packed and sealed in an outer pouch of 65-75  $\mu$ k polypropylene and after loading into Al pouches are steamed for 20 minimum and then heat processed at 115 C for 24-30 minimum (depending on the type of product) under a steam pressure of 20 lb/sq in (1.41 kg/cm<sup>2</sup>). Data on typical heat penetration and process value calibration and cost estimates for production of the three food packs have been presented. The products were found acceptable and satisfactory even after 4 months storage. Based on these investigations the cost per packet (250 g) of (i), (ii) and (iii) have been worked to be Rs. 4.08, Rs. 3.75 and 5.95 respectively. BSN

- 1032 SCHILLING (D) and ULRICH (KH). On the food purchasing habits of the inhabitants of new residential complexes. *Ernährungsforschung*. 24(1); 1979; 17-20

## FOOD PROCESSING AND PACKAGING

### PROCESSING

- 1033 BOQUET (R), CHIRIFE (J) and IGLESIAS (HA). On the equivalence of isotherm equations. *J. Food Technol.* 15(3); 1980; 345-9
- 1034 GENTRY (JW). Inspection techniques. *Cereal Food World*. 25(6); 1980; 310-11  
Pertains to sanitary inspection of food processing facilities. KAR
- 1035 ROWLEY (DB) and BRYNJOLFSSON (A). Potential uses of irradiation in the processing of food. *Food Technol.* 34(10); 1980; 75-7  
Organisms resistant to radiation, potential application of radiation to preserve food; radappertization and regulatory aspects have been covered. KAR
- 1036 SEIBEL (W). The Federation Research Institute for cereal and potato processing as mediator in food-legislative problems related to baked goods. *Getreide Mehl Brot*. 33(11); 1979; 307-10 (German)

### PACKAGING

- 1037 ANANDASWAMY (B) and VIJAYENDRA RAO (AR). Central Food Technological Research Institute in the service of packaging industry. *Packag. World*. 15(1/2); 1980; 7-9
- 1038 ANON. Combine filling, sealing, capping, to achieve no-overflow, air-free fill. *Packag. Eng.* 25(5); 1980; 64-5



- 1039 ANON. Growing use of variable data brings more and more coders and printers on-line. *Packag. Eng.* 25(5); 1980; 81-3
- 1040 ANON. New composite containers: Combine strength with barrier: state of the art. *Packag. Eng.* 25(5); 1980; 41-4  
Discusses : Composite can structure; vacuum nitrogen flush; packaging liquids; and production of desired containers. BSN
- 1041 ANON. Packaging in transition : From hand packing to automatic tray loading. *Packag. Eng.* 25(5); 1980; 51-3
- 1042 ANON. Research and development associates find all-out military commitment to retortable pouch. *Packag. Eng.* 25(5); 1980; 88-93
- 1043 DAS (PR). Metal container industry. *Packag. World.* 15(1/2); 1980; 15-8
- 1044 GIACIN (JR). Tracking down those toxics: With gas chromatography and mass spectroscopy. *Packag. Eng.* 25(5); 1980; 70-9
- 1045 GRUNDKE (G) and KUKLOK (K). The cryptoclimate in food packages. *Lebensmittel-Industrie.* 27(1); 1980; 13-7 (German)  
The cryptoclimate in packages, which can differ from the environmental climate, is often the main cause for the change in the quality of the packed material. In this article the results of tests have been reported and their objective was to follow up the development of climate in packages during storage and to determine experimentally the factors responsible for this cryptoclimate in food packages. KMD
- 1046 ITO (KA) and BEE (GR). Microbiological hazards associated with new packaging techniques. *Food Technol.* 34(10); 1980; 78-80  
The review covers aseptic packaging, retort pouches, plastic bags and wraps, and modified-atmosphere packaging. KAR
- 1047 NIEBERGALL (H), HUMEID (A) and BLOCHEL (W). Aroma permeability of packaging foils and its determination with the aid of a newly developed measuring apparatus. III. Application of the new apparatus for determination of permeation coefficients, illustrated by examples of polyethylene and cellophane. *Food Sci + Technol.* 12(2); 1979; 88-94 (German)  
A mixture of equal portions by weight of aliphatic alcohols was used as the test substance (or aroma model). In the case of apolar polyethylene, its permeability to the alcohols increased almost exponentially with the increase in the C-number of alcohol. In the case of cellophane, its permeability depended to a great extent on the relative humidity of the alcohols. Within the RH range of 32-94% at 20 C, the permeability increased 1600-fold in the case of methanol, and even 4300-fold for n-propanol. At 94% RH, cellophane is about 1000 times more permeable than polyethylene, while at 32% RH it is 10 times tighter. The permeability of cellophane increases with the polarity of the alcohol, while the opposite is true in the case of polyethylene. A method of calculation has been derived for the determination of permeation coefficients. KMD
- 1048 OGAWA (S), TONOGAI (Y), ITO (Y) and IWAIDA (M). Elution of artificial colors from cardboard and wrapping paper used for food packages. *J. Food Prot.* 42(4); 1979; 297-8



- 1049 REINELT (GR), BECKER (K) and HEISS (R). The influence of oxygen-transport in highly viscous packaged foods, on their spoilage behaviour. *Food Sci + Technol.* 12(2); 1979; 76-84 (German)
- An apparatus has been developed for the measurement of oxygen-consumption of foods under aseptic conditions, and also a method of calculation for simulating the deterioration of compact food. The calculation method was checked against some experimental results obtained with mayonnaise, and a good agreement was obtained between the experimental and calculated results. KMD
- 1050 SEALE (PE). Innovations to tinplate : the processors' perspective of the tinplate industry. *Food Technol. Aust.* 32(7); 1980; 354-8
- 1051 SEN (R). Plastic coated materials in flexible packaging. *Packag. World.* 15(1/2); 1980; 19-20
- 1052 VADODARIA (JK) and DIAS (AB). PVC in packaging. *Packag. World.* 15(1/2); 1980; 21-4
- 1053 VOM BRUCK (CG), RUDOLPH (FB), FIGGE (K) and ECKERT (WR). Application of the diffusion theory to migration of plastics components into packaged goods; survey of recent migration studies. *Food Cosmet. Toxicol.* 17(2); 1979; 153-7

## FOOD ENGINEERING AND EQUIPMENT

- 1054 BRONDKE (V). Calculation of unsteady temperature fields in solids as basis of the design of plants for the food industry. *Lebensmittel-Industrie* 27(1) 18-21, (2) 59-63; 1980 (German)
- Values of the thermodynamic processes, obtained empirically often form the basis of the dimensioning of plants for heat and cold treatment of product in the food industry. It is a question of excessively increased costs and of power consumption exceeding the optimum. This article deals with the thermodynamic relations of the unsteady heat exchange and possibilities of the calculation of the temperature conditions for the design of plants. AA
- 1055 CRANSTON (PM). Simple and versatile vapour absorber device. *Food Technol. Aust.* 32(7); 1980; 360-2
- A modification of the Standard Soxhlet Extractor is described which has proved to be a versatile gas absorption apparatus in SO<sub>2</sub> and total nitrogen determinations of foods. AA
- 1056 HELMRICH (H) and SCHUGERL (K). Rotary kiln in chemical engineering. *Chemie-Ingenieur-Technik* 51(8); 1979; 771-8 (German)
- 1057 MATHASON (IJ). The flourometer: A new method and concept in flour testing. *Baker's Dig.* 54(2); 1980; 22-4
- There are some yet unknown factors in flour quality which are not apparent through existing testing methodology. The flourometer has been developed and used to find out such hidden unknown variables. The method developed can differentiate between (i) inferior and improved strength characteristics of flours of similar protein content; (ii) properly milled and over milled flours from the same lot, (iii) the effectiveness of chlorine treatment of cake flour, (iv) flour and samples of the same flour to which pentosan has been added, (v) gross difference in protein content (vi) rye flour of acceptable quality and that which has had excessive storage time and (vii) mixing requirements



for flours of similar protein values can be estimated through comparison of flour strength values. KAR

- 1058 NETH (N), KAUTZ (G), HUSTER (H-J) and WAGNER (U). Kinetics of SO<sub>2</sub> oxidation. *Chemie-Ingenieur-Technik*. 51(8); 1979; 825 (German)
- 1059 PICHERT (H). A new test apparatus for the measurement of the firmness of viscous foams of food. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 284-9  
The testing apparatus customary in the trade for measuring the firmness of whipped cream, does not give exact results because of its measuring system. In contrast the testing apparatus described here, is suitable for determining the firmness of viscous foams of food. It has already been applied successfully to the measurement of the firmness of whipped cream and egg-white. AA

## FOOD CHEMISTRY AND ANALYSIS

- 1060 ANTONOV (JUA), GRINBERG (VJA) and TOLSTOGUZOV (VB). Thermodynamic aspects of the compatibility of proteins with polysaccharides in aqueous media. Part III. Some physico-chemical factors of the phenomena of the thermodynamic incompatibility of proteins with polysaccharides. *Nahrung*. 23(9/10); 1979; 847-62 (German)
- 1061 BERGNER (H). Inter relationships between chemical structure and function of food components. Part 2. *Ernährungsforschung*. 24(1); 1979; 9-11 (German)  
The author has discussed in outline the roles of alcohols (ethanol, 1,3-butanediol) and fatty acids (oleic, elaidic and erucic) in human physiology and pathology. KMD
- 1062 BIEDERMANN (R), LEU (D) and VOGELSANGER (W). Nitrates in foodstuffs : A fixation of the actual position. *Dtsch. Lebensmittel-Rundschau*. 76(5) 149-56; (6) 198-207,; 1980 (German)  
Nitrates have only very little toxicity for human adults, but there is a possibility of bacteria mediated reduction of nitrates to nitrites. Nitrites together with ubiquitous amines can lead to an *in vivo* synthesis of cancerogenous nitrosamines. The content of nitrate in vegetables is dependent on factors which are modifiable, like species and fertilizers and on environmental factors like light, temperature, etc. Leaching of nitrate is influenced by the cultivation process, fertilization, soil structure and climatic factors. Nitrate is also used as an additive during the processing of cheese and meat. In this article the authors have suggested how to meet the recommendations of toxicologists for a drastic reduction of the nitrate intake of our population. A further possibility for the reduction of nitrate accumulation in plants is given by specific selection methods of plant cultivators. KMD
- 1063 CHEN (CC) and KARMAS (E). Effect of surface active agents on water activity in intermediate moisture foods. *Food Sci + Technol*. 12(2); 1979; 68-71  
The relationship between water activity and surface active agents was studied using an electric hydrometer and ring method. Surfactants had a significant effect on the water monolayer, surface area, and heat of sorption, as calculated by the BET equation. In food model systems and "Intermediate moisture" milk, water activity increased as the concentration of surfactants increased. As agents that increase surface tension of the aqueous phase of food systems are not available, ingredients which result in the reduction of surface tension should be avoided in the processing of intermediate moisture foods, in order to attain a lower water activity. KMD



- 064 DIEHL (J-F). Reduction of radiation induced vitamin losses by irradiation of foodstuffs at low temperatures and by exclusion of atmospheric oxygen. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 276-80 (German)
- The protective effect of low temperatures during irradiation on vitamin B<sub>1</sub> and E levels in foods is not abolished by subsequent storage or heating. Egg powder irradiated at 1 Mrad in the presence of air and stored for 4 months at ambient temperature lost 68% of its thiamin content and when irradiated at 20 C, 33% was lost. Sunflower oil irradiated at 3 Mrad in the presence of air and subsequently heated for 1 hour at 180 C lost 98% of its  $\alpha$ -tocopherol content when irradiated at 20 C only 65%. Exclusion of atmospheric oxygen by packaging under nitrogen reduced the loss of  $\alpha$ -tocopherol in irradiated (0.1 Mrad) rolled oats after 8 months of storage from 56 to 5% and the loss of thiamin from 86 to 26%. Vacuum packaging was equally effective during the first 3 months and somewhat less effective during the following 5 months. Packaging under carbon dioxide showed no advantage over packaging in air. Sensory evaluation of rolled oats, raw or cooked, 1 and 3 months after irradiation with 0.1 Mrad indicated no significant quality differences between unirradiated and irradiated samples packaged under nitrogen. AA
- 065 DIEHL (J-F), DELINCEE (H) and PAUL (P). Radiation-induced changes in food models : Protein aggregation. *Food Sci + Technol.* 12(2); 1979; 121-2
- Protein aggregation can be caused by the free radicals present in irradiated water, and by the free radicals of autoxidizing unsaturated lipids. The presence of carbohydrates reduces radiation-induced aggregation, presumably because the carbohydrates compete for OH-radicals. Carbohydrates apparently do not affect autoxidation-catalyzed aggregation. It should be interesting to establish whether the protein aggregates induced by irradiation, and those induced by autoxidizing lipids, are chemically identical. KMD
- 066 GIL (V) and MacLEAD (AJ). Glucosinolates of *Lepidium sativum* and 'garden cress'. *J. Sci. Food Agric.* 31(7); 1980; 739-41
- 067 TAMCHEV (S), IONCHEVA (N), GENOV (N) and MALCHEV (E). Kinetics of the thermal degradation of some phenolic acids. *Nahrung.* 23(9/10); 1979; 863-9
- 068 ZIMMERMANN (K) and LENGERKEN (JV). Analysis of nitrates and nitrites in feeds. III. Spectrophotometric estimation of nitrate and nitrite with 1-naphthylamine sulphanilate, and of nitrite with resorcin/zirconium (IV) - oxychloride. *Nahrung.* 23(9-10); 1979; 929-34
- The nitrate content in feeds can be determined by a dye-binding method, after the nitrate has been reduced by active cadmium produced in the test solution. A simple method of measuring nitrite is to evaluate colorimetrically the coloured chelate complex of nitrite with resorcin/zirconium (IV) oxychloride. This method of nitrate estimation can be employed even in small laboratories which do not do such analyses regularly. KMD

## FOOD MICROBIOLOGY

- 069 CHIPLEY (JR) and CREMER (ML). Microbiological problems in the food service industry. *Food Technol.* 34(10); 1980; 59-69, 84
- An exhaustive report covering review of microbiological quality studies conducted so far, and microbiological analyses conducted at school food service, feeding program conducted for elderly, hospital food service and results of some fast food survey conducted. KAR



- 1070 COLLINS (EB) and HARDT (P). Inhibition of *Candida albicans* by *Lactobacillus acidophilus*. *J. Dairy Sci.* 63(5); 1980; 830-2
- 1071 DRAUGHON (FA). Effect of plant-derived extenders on microbiological stability of foods. *Food Technol.* 34(10); 1980; 69-74  
This review deals with plant proteins as extruders, effect on microorganisms; bacteriological quality of, proteins; their relation to food borne disease and the future research needs. KAR
- 1072 FRANKE-RINKER (D) and BEHRENS (U). Enzymatic investigations on the citrate-isocitrate-accumulation in yeasts. *Nahrung.* 23(9/10); 1979; 891-7 (German)
- 1073 PANCHAL (CJ) and STEWART (GG). The effect of osmotic pressure on the production and excretion of ethanol and glycerol by a brewing yeast strain. *J. Inst. Brew.* 86(5); 1980; 207-10
- 1074 RAY (B). Methods to detect stressed microorganisms. *J. Food Prot.* 42(4); 1979; 346-55
- 1075 READ (RB) Jr. Detection of stressed microorganisms. Implications for regulatory monitoring. *J. Food Prot.* 42(4); 1979; 368-9

#### MUSHROOM

- 1076 MINAMIDE (T), HABU (T) and OGATA (K). Effect of storage temperature on keeping freshness of mushrooms after harvest. *J. Jpn. Soc. Food Sci.* 27(6); 1980; 281-7 (Japanese)  
This report describes the effects of the storage temperature on the shelf life and the quality of some kinds of mushrooms, "mushroom" (*Agaricus bisporus* Sing.), oyster mushroom (*Pleurotus ostreatus* (Fr.)), shii-take (*Lentinus edodes* (Berk) Sing.), nameko (*Pholiota nameko* (T. Ito) S. Ito et. Imai) and enoki-take (*Flammulina velutipes* (Fr.) Sing.). The shelf life of these mushrooms was about 14-20 days at 1 C, about 10 days at 6 C and 2-3 days at 20 C. It was found that the deterioration of mushrooms were caused mainly by opening and browning of the pilei, as well as elongation and browning of the stipes. Especially in "mushroom" and shii-take, browning of the pilei, gill, and stipes and polyphenoloxidase activity were markedly developed during storage at 20 C. Higher respiration rate than that of other horticultural products was observed for harvested mushrooms as much as about 200-500 mg CO<sub>2</sub>/kg/hr at 20 C. Glutamic acid, aspartic acid and their amides were shown as the major components of free amino acids in each mushroom. Total free amino acid content increased in shii-take, nameko, or oyster mushroom during storage at 20 C. AA

#### FOOD ADDITIVES

- 1077 ANDERSON (RL). Response of male rats to sodium saccharin ingestion : urine composition and mineral balance. *Food Cosmet. Toxicol.* 17(3); 1979; 195-200
- 1078 ANON. Monosodium glutamate (MSG). *Food Technol.* 34(10); 1980; 49-53  
Resume of a scientific status study covering toxicity studies, effect on the fetus and young child, effect on central nervous system, safety, Chinese dietary syndrome and the regulatory status. KAR



- 1079 BHATT (A) and GUPTA (VK). Studies on pollutants : Spectrophotometric determination of nitrite as "azoxine dye". *J. Indian. Chem. Soc.* 57(11); 1980; 1056-8
- Nitrite in water has been determined by using a diazotized aromatic amine with 8-hydroxyquinoline as a coupling agent. Out of the ten amines tested, sulphanilamide proved to be the most suitable for the determination of nitrite. The proposed method has the following advantages over the  $\alpha$ -naphthylamine method: it requires less time; the stability of the reagent and the dye is higher; it does not require rigorous control of pH and temperature. KMD
- 1080 EVANS (JG), GAUNT (IF) and LAKE (BG). Two-year toxicity studies on coumarin in the baboon. *Food Cosmet. Toxicol.* 17(3); 1979; 187-93
- Coumarin is used as a flavouring agent in food and tobacco, and also as a perfume in cosmetics and toiletries. The no-untoward-effect level was estimated as 22.5 mg/kg/day, if dilatation of the endoplasmic reticulum of the liver is taken as the criteria. On the basis of conventional histological evidence, however, the no-untoward-effect level would be three times as high. KMD
- 1081 FIELDS (H). Future market requirements of flavors. *Perfum. Flavor.* 5(4); 1980; 23-6
- 1082 ROBACH (MC). Influence of potassium sorbate on growth of *Pseudomonas putrefaciens*. *J. Food Prot.* 42(4); 1979; 312-3
- The effect of potassium sorbate on growth of two strains of *Pseudomonas putrefaciens* (Alteromonas) was studied. Addition of 0.2% sorbate to trypticase soy broth (pH 6.0) inactivated strain P19X and resulted in a 3-log cycle reduction in number of viable cells of strain P5LIN through 6 days of incubation at 24 C. AA
- 1083 ROBACH (MC). Use of preservatives to control microorganisms in food. *Food Technol.* 34(10); 1980; 81-4
- Covers chemical preservative of which the major one are benzoates, parabens, propionates, sorbates, and others like acidulants, antioxidants, nitrites and sulfites and the regulations concerning the use of preservatives. KAR
- 1084 STOFBERG (J). The future of artificial flavouring ingredients. *Perfum. Flavor* 5(4); 1980; 17-22
- 1085 WALSON (PD), CARTER (DE), RYERSON (BA), HALLADAY (SC) and PARKINSON (TM). Intestinal absorption of two potential polymeric food additives in Man. *Food Cosmet. Toxicol.* 17(3); 1979; 201-3
- Intestinal absorption of two  $^{14}\text{C}$ -labelled polymeric compounds, an antioxidant (D00079) and a red colouring (D00478) being developed for use in foods, was measured in healthy adult male volunteers. Blood and urine data indicate that both compounds were only minimally absorbed in man, confirming earlier results in rats, mice, guinea-pigs and rabbits. AA

## CEREALS

- 1086 ABRAMSON (D), SINHA (RN) and MILLS (JT). Mycotoxin and odour formation in moist cereal grain during granary storage. *Cereal Chem.* 57(5); 1980; 346-52
- Half bushel samples of barley, wheat and oats with 21.0% moisture, placed inside bulk stored oats in a farm granary for 20 weeks, showed presence of ochratoxin A at detectable levels in barley at the end of 4 weeks of storage. At the end of 20 weeks, barley contained five times more ochratoxin A than



ochratoxin production from wheat due to presence of *Penicillium verrucosum* var. cyclopium. An increase in fungal volatiles from 10-fold to 15-fold was observed seven weeks after storage, which however, declined to control levels at the end of 16 weeks of storage. Of the three known fungal odours tentatively identified, 1-octanol was found in greater amounts than those of 3-methyl-1-butanol and 3-octane. Among the three commodities examined, barley alone showed the least heating, moisture increase, O<sub>2</sub> decrease, CO<sub>2</sub> increase, fat acidity value increase and germination loss. BSN

- 1087 BOLLING (H). Problems with rye and wheat in the cereal year 1978/79. *Getreide Mehl. Brot.* 33(11); 1979; 281-5 (German)

- 1088 PUCHWEIN (G), GABRIELE SCHMIDINGER (G), HAIN (S) and DIETER KRUTZEN. Determination of the chlorocholine chloride-residues in cereals by remission spectrophotometry after thin layer chromatographic isolation. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 339-42 (German)

A method is described which permits the rapid and sensitive determination of chlorocholine chloride residues after thin layer chromatographic isolation by remission spectrophotometry of the dipicrylamine complex. The method has so far been applied to wheat and oats with a sensitivity of 0.01 ppm. AA

#### PADDY

- 1089 BANDYOPADHYAY (S) and ROY (NC). Desorption characteristics of hot-soaked parboiled paddy. *J. Food Technol.* 15(3); 1980; 329-33

The desorption of water from a thin layer of hot-soaked parboiled paddy grains was studied under constant drying conditions within a temperature range 40-70 C and at a constant relative humidity of 60%. The data of one variety of paddy were correlated with the help of the semi-empirical diffusion equation which was confirmed with the soaking data of a large number of paddy varieties by the authors. The results indicated that activation energy of the diffusional process (7654 cal/mole for moisture absorption and 7600 cal/mole for the desorption process) is independent of the direction of changes in the moisture level. AA

#### RICE

- 1090 BHATTACHARYA (KR) and SOWBHAGYA (CM). On the alkali degradation type of rice kernels. *J. Sci. Food Agric.* 31(6); 1980; 615-8

When immersed in dilute potassium hydroxide solution, milled rice kernels of different varieties undergo different patterns of degradation. Five types of degradation, designated A, B, B<sub>1</sub>, C and D have been identified. These types correlate well with other quality indices of rice. AA

- 1091 BRADBURY (JH), COLLINS (JG) and PYLIOTIS (NA). Amino acid analyses of the proteins of the major histological components of a high-protein rice. *Cereal Chem.* 57(5); 1980; 343-6

The major histological components (endosperm, embryo and aleurone cells plus grain coat) of a high-protein rice (IR 480-5-9) were separated and examined by light and electron microscopy, and the various protein and amino acid analyses were determined. Thus the distribution of protein and of each amino acid in the histological components of the whole grain was obtained, and a satisfactory balance was made with analyses of the whole grain. The histological components that constitute the bran (embryo, aleurone cells, and grain coat) account for less than one-tenth of the weight of the whole grain of IR



480 yet contain about one-seventh of the total amount of protein and one-fifth of the first limiting amino acid, lysine. Nearly 50% more protein and about 20% more lysine were found in high-protein brown rice than in ordinary brown rice and also in high-protein milled (white) rice as compared with ordinary milled rice. The substantial gains in protein and lysine in high-protein milled rice for outweigh the slight reduction in its protein digestibility as compared with ordinary milled rice; consumption of the former variety would be advantageous. AA

- 1092 TSUJI (S). On the measurement of the texture for cooked rice in grain level by two points mensuration method and the textural parameters related to the mouth feeling. *J. Jpn. Soc. Food Sci. Technol.* 27(6); 1980; 265-9
- A convenient method of the multi-point mensuration method was applied to compare the texture of cooked rice in grain level. The convenient method used in this report is two points (50% and 90% deformation) mensuration method. Tensipresser reported previously was most suitable for this measurement. The ratio of the textural parameters measured at 50% compression to those at 90% compression could be used for relative comparisons of the texture of cooked rice. Especially, the ratio of adhesiveness to hardness measured at 50% compression and the ratio adh./hard at 50% compression to adh./hard. at 90% compression were the most useful indices in rating the textural property of cooked rice which related to the mouth feeling. AA

## WHEAT

- 1093 BRACCIALI (A), CANTAGALLI (P), POMPUCCI (G) and TARLI (P). Note on the identical immunological behavior of a protein fraction from durum wheat germ and a purified lectin from soft wheat germ. *Cereal Chem.* 57(5); 1980; 367-8
- 1094 HARGIN (KD), MORRISON (WR) and FULCHER (RG). Triglyceride deposits in the starchy endosperm of wheat. *Cereal Chem.* 57(5); 1980; 320-5
- 1095 HOLMES (LG). Note on fluorometric method for determination of uric acid in flour. *Cereal Chem.* 57(5); 1980; 371-2
- The fluorometric method reported for estimation of uric acid in insect infested wheat flour involves, dispersal of 0.5 g of sample in 25 ml acetate buffer (0.2 M sodium acetate buffer and justed to pH 11.8 - 12.0 with 2N NaOH), stirring of the mixture, centrifuging at 3000 rpm for 10 min, filtering the supernatant through a 45-mm AA millipore filter and reading in a flourometer at 420 nm and plotting a curve for calculation of uric acid content. Recoveries from this rapid method were 96.2 - 98.6% when 8.0 - 48.0 mg/100 g of added uric acid to wheat flour. BSN
- 1096 JEANJEAN (MF), DAMIDAUX (R) and FEILLET (P). Effect of heat treatment on protein solubility and viscoelastic properties of wheat gluten. *Cereal Chem.* 57(5); 1980; 325-31
- 1097 MENDER (A). Experiences with pasta not made exclusively of durum wheat. *Getreide Mehl Brot.* 33(11); 1979; 299-302 (German)
- A general view on experience with pasta from mixtures of durum and soft wheat grits has been given. The effect of egg components in connection with wheat mixtures has been described. Experiments with additives of maize flour and with dietetic pasta have been explained. KMD



- 1098 PRESTON (KR) and TIPPLES (KH). Effects of acid-soluble and acid-insoluble gluten proteins on the rheological and baking properties of wheat flours. *Cereal Chem.* 57(5); 1980; 314-20

Double strengthening effects observed when gluten proteins were added to base flours were mainly traceable to proteins present in the acid-soluble gluten-protein fraction. Acid-insoluble protein, however, at higher levels caused a slight dough-weakening effect. Increased loaf volumes were obtained in bread added with increasing levels of gluten, when bread was prepared by both the grain research laboratory's chorleywood and by remix baking procedures. Addition of acid soluble gluten proteins produced the same effect of loaf volume. BSN

- 1099 RANUM (PM), BARRETT (FF), LOEWE (RJ) and KULP (K). Nutrient levels in internationally milled wheat flours. *Cereal Chem.* 57(5); 1980; 361-6

Data on ash, protein, thiamin, riboflavin, niacin, iron, calcium, magnesium and zinc contents of ninety five samples of commercially milled wheat flours, obtained from 30 countries have been presented and discussed. Further, information on wheat, milling extraction rates, flour type and its end use, production quantities and government regulations has been reported. Nutrient levels directly increased with flour ash values, except for calcium and protein which hardly showed any change. A nutrient score reflecting composition and density of wheat nutrients in flour has been formulated. The nutrient score of a typical flour (ash 0.6% or below, extraction 72-78%) was 29, approximately about 1/3 of optimum wheat. BSN

- 1100 WILSON (JE) and LORENZ (K). Biotin and choline in wheats and wheat flours. *Food Sci + Technol.* 12(2); 1979; 72-5

Samples of 40 flours and 30 wheats of different varieties were analyzed for their content of biotin and choline. Biotin was determined microbiologically and found to be present at the levels of  $0.051 \pm 0.011$   $\mu\text{g/g}$  and  $0.014 \pm 0.004$   $\mu\text{g/g}$  in whole wheats and flours, respectively. Choline was determined as the Reineckate precipitate and found to be present at the levels of  $293 \pm 91.1$   $\mu\text{g/g}$  and  $160 \pm 78.7$   $\mu\text{g/g}$  in whole wheats and flours, respectively. Whole wheats contained markedly higher levels of both biotin and choline than their commercially milled flours, indicating that significant vitamin losses occur during milling. Hard wheats contained significantly more biotin than soft wheats. The differences in choline content between hard and soft wheats were insignificant. AA

#### OAT

- 1101 MEYER (D) and ZWINGELBERG (H). Laboratory trials for testing the suitability of oats for the production of flakes. *Getreide Mehl. Brot.* 33(11); 1979; 285-90 (German)

Processes for examining the suitability of oat of different varieties and origins have been developed. The preparation of oat prior to shelling was done by moistening to 15% and by an additional hydrothermic treatment. Removal of husks was done according to the principle of centrifugal force. Machines with lowest output used in the grain processing industry were employed for cleaning and flaking of oat. In the sensory evaluation of oat flakes clear differences could be ascertained with regard to taste and smell. A correlation between the external quality characteristics of raw oat and the processing quality could not be found. KMD



## MILLETS

## PEARL MILLET

- 102 ADELAIDE BELEIA, VARRIANO-MARSTON (E) and HOSENEY (KC). Characterization of starch from pearl millets. *Cereal Chem.* 57(5); 1980; 300-3
- Starch isolated from five random-mating populations of pearl millet varied in cold water-binding capacity (83.6-99.5%) and initial (59-63 C) and end point (68-70 C) gelatinization temperatures. Swelling power at 95 C varied between 14.1 and 16.4; starches with low swelling powers also were less soluble during heating. More variations among starch amylograms were observed during the cooling than the heating cycle, suggesting that some starches tend to retrograde less than others. Small variations in amylose contents (20-22%) among starches indicated that other physiochemical factors, such as molecular dimensions, may be more important than amylose content in determining the characteristics of pearl millet starches. AA

## MAIZE

- 103 LEE (LS), LILLEHOJ (EB) and KWOLEK (WF). Aflatoxin distribution in individual corn kernels from intact ears. *Cereal Chem.* 57(5); 1980; 340-3
- Among kernels (198 kernels) examined, aflatoxin distribution was extremely heterogeneous (100-80,000 ng/g). Kernels with very high aflatoxin content were found next to aflatoxin-free kernels. Some BGY-fluorescent kernels did not reveal the presence of aflatoxin. However, 85% of contaminated kernels were BGY-fluorescent. Ear-to-ear variation was also observed in the four rows in damaged areas of corn exhibiting mold contamination. BSN

## PULSES

## MUNG BEAN

- 104 REDDY (NR) and SALUNKHE (DK). Changes in oligosaccharides during germination and cooking of black gram and fermentation of black gram/rice blend. *Cereal Chem.* 57(5); 1980; 356-60
- The oligosaccharides of the raffinose family of sugars account for 61% of total sugars in black gram seeds and cotyledons. The black gram seeds studied had 3.4% verbascose, 0.9% stachyose, a trace of raffinose, and 1.5% sucrose, whereas the black gram cotyledons contained 4.0% verbascose, 0.7% stachyose, a trace of raffinose, and 1.5% sucrose on a dry weight basis. Germination of black gram seeds for 48 hr resulted in complete disappearance of verbascose, stachyose, and raffinose; the sucrose content was unchanged after 24 hr of germination. Increased  $\alpha$ -galactosidase activity was observed during the first 48 hr of germination and throughout the 45-hr fermentations of black gram/rice and of black gram blends. Cooking for 40 min at 10 psi (116 C) caused a decrease in the oligosaccharide content of black gram cotyledons. Polished Texas long grain rice did not contain the verbascose, stachyose, and raffinose but had a trace of sucrose. Fermentation of black gram/rice and of black gram blends for 45 hr decreased the original oligosaccharides to 28 and 71% respectively. Steaming of batter made from black gram/rice blend fermented for 20 hr produced an acceptable product. Idli, that contained about 0.1% verbascose and 0.2% stachyose, representing 44% of the total sugars. AA



## GREEN BEAN

- 1105 STEINBUCH (E). The effect of heat shocks on quality retention of green beans during frozen storage. *J. Food Technol.* 15(3); 1980; 353-5

An ultra-short heat treatment by soaking green beans for 10 sec in large quantity of boiling water, followed by rapid cooling results in slowing down of colour deterioration. As such, this product shows colour between that of unblanched and blanched green beans. The quality parameters of heat-shocked beans are in close proximity to those of freshly cooked green beans with regard to colour, flavour and texture. BSN

## OILSEEDS AND NUTS

## RAPESEED

- 1106 UPPSTROM (B) and SVENSSON (R). Determination of phytic acid in rapeseed meal. *J. Sci. Food Agric.* 31(7); 1980; 651-6

The method is based on the extraction of the phytate with 15% trichloroacetic acid. After enzymatic hydrolysis with phytase from wheat the phosphate is determined spectrophotometrically. KAR

## SUNFLOWER

- 1107 CANELLA (M), CASTRIOTTA (G) and BERNARDI (A). Functional and physicochemical properties of succinylated and acetylated sunflower protein. *Food Sci + Technol.* 12(2); 1979; 95-101

## SOYABEAN

- 1108 CENKOVA (J) and SIMUNEK (Z). Effects of extracting agents upon the physical and chemical properties of soya protein concentrate. *Prumysl Potravin.* 30(6); 1979; 352-4 (Czech)

- 1109 CICHON (R), ELKOWICA (K), KOZLOWSKA (H), RUTKOWSKI (A) and SAUER (WC). Nutritional evaluation of meat-soya bean protein product blends. *J. Sci. Food Agric.* 31(7); 1980; 677-84

Protein efficiency ratio (PER) and net protein utilization (NPU) were significantly lower in blends containing either 20% protein from soya isolate or 40% protein from soya concentrate or soya flakes than blends containing sirloin only. No significant differences in PER and NPU were noted when model meat (consisting of 70 and 30% protein from sirloin and connective tissue respectively) was replaced by up to 20% protein from soya isolate or up to 40% protein from soya concentrate. KAR

- 1110 FUKU (Y) and MATSUOKA (H). Coagulation of soymilk by proteolytic enzyme treatment. *J. Jpn. Soc. Food Sci. Technol.* 27(6); 1980; 275-80 (Japanese)

Soy milk was treated with proteolytic enzymes, including ficin, bromelain, papain, rennet and pepsin to investigate their digestibility and coagulability. Coagulation of soymilk occurred within a short time after addition of ficin and bromelain, but papain treated soymilk required too long time for coagulation. Rennet and pepsin had no coagulability. It was clear that heat treatment of soymilk at the temperature about 70 C, corresponding to the denaturation of



soy protein, was essential for coagulation of soymilk by proteolytic enzymes. The coagulability of ficin and bromelain for soymilk rapidly decreased by heat treatment of each enzyme solution at temperature above 65 C. As the coagulation of soymilk resulted in proteolysis of soy protein, the recovery of protein in coagulants from soymilk was comparatively low at reaction temperature in the range of 40~60 C. To improve the protein recovery,  $1.0 \times 10^{-5}$  or  $1.0 \times 10^{-6}$  mol calcium was added to soymilk with enzymes. Addition of calcium, however, had no effect on the coagulability and protein recovery. The lactic fermentation of soymilk by *Streptococcus thermophilus* considerably reduced coagulation time and increased the protein recovery. In the manufacturing process of cheese like product with application of curd formation by lactic fermentation and addition of ficin or bromelain, the curds obtained had no bitterness and the percentage of protein recovery reached approximately 80%. AA

## TUBERS AND VEGETABLES

- 1111 STEINBUCH (E). Quality retention of unblanched, frozen, vegetables by vacuum packing. II. Asparagus, parsley and celery. *J. Food Technol.* 15(3); 1980; 351-2

Unblanched frozen (i) asparagus, (ii) parsley and (iii) celery, subjected to (a) normal packing or (b) vacuum packing were assessed for their quality retention and shelf life. Enzymes in the peel of (1) probably effect the quality retention of unblanched frozen product and (b) aids retention of original flavour and colour in (i) and (ii). Shelf life of peeled (i)(a) was 3 months as against (i)(b) of 4 months. In case of unpeeled (i) it was 1 week for (a) while it was 2 weeks for (b), (ii)(a) had 2 weeks shelf-life, while (b) showed 1 week in (a) as against 1 month for (b). Celeriac tuber could be stored in (a)  $\leq$  1 week, as against in (b) for 1 month. BSN

### GARLIC

- 1112 RAJ (KPS), AGRAWAL (YK) and PATEL (MR). Analysis of garlic for its metal contents. *J. Indian. Chem. Soc.* 57(11); 1980; 1121-2

The contents (mg/100 g fresh weight) of various metals in garlic has been found to be Zn 3.961, Ni 0.043, Co 0.028, Cr 0.023, Fe 1.895, Ca 2.687, Mg 17.820, Cu 0.170, K 410.600, Na 8.487, V 0.010, Mo 0.001, Ti 0.001 and Ce traces. KMD

### CARROT

- 1113 MAUR (J) and MAUR (P). What effects have the variety of carrot and processing technology applied to make semi-products upon the concentration of nutritive substances in them. *Prumysl Potravin.* 30(6); 1979; 317-8 (Czech)

### RADISH

- 1114 KANEKO (K), KURASAWA (H) and MAEDA (Y). Chemical properties of pectic substances and composition of cell wall polysaccharides from Japanese radishes and their changes during drying and salting. *J. Jpn. Soc. Food Sci. Technol.* 27(6); 1980; 298-304 (Japanese)

This report deals with chemical properties of pectic substances and compositions of cell wall polysaccharides from roots of four varieties of Japanese



radish (*Raphanus sativus* var. *hortensis*) and their changes during drying and salting of representative radish roots consumed as raw materials of pickles. The polysaccharides of radish cell wall consisted of 36 to 38% of pectic substances, 23 to 29% of crude fiber and 9 to 12% of hemicelluloses. The pectic substances contained 76 to 85% of anhydrogalacturonic acid and 4.08 to 7.26% of methoxyl group. By DEAE-cellulose chromatography, the pectic substances were divided into six fractions whose main fractions were P-3 and P-4. The result of paper chromatography showed that P-2, P-3, P-4 and P-5 were composed of galacturonic acid, galactose, arabinose, xylose and rhamnose. Drying and salting had a great influence on the composition of cell wall polysaccharides and chemical properties of pectic substances. The total amount of pectic substances in dried radish decreased, while that in salted radish did not change. On the other hand, the crude fiber content increased in both radish. The methoxyl group content of pectic substances in dried and salted radish markedly decreased. These results suggest the possibility that drying and salting may reduce the solubility of pectic substances. The main fractions from pectic substances by DEAE-cellulose chromatography were P-3 and P-4 in fresh radish roots, while those in dried and salted radish roots were P-4 and P-5. AA

- 1115 KATO (S), KITAMURA (E) and OOSHIMA (S). Organic acid in fresh radishes and their changes in the process of making salted radish. *J. Jpn. Soc. Food Sci. Technol.* 27(6); 1980; 305-6 (Japanese)

The organic acids in four cultivars of fresh radish and their changes in the process of making salted radish were investigated by a carboxylic acid analyzer. Fresh radishes contained malic, pyroglutamic, citric, glucuronic, acetic and succinic acids. The amount of malic acid was largest being followed by pyroglutamic acid. The pattern and content of organic acid in fresh radishes of four cultivars were almost same. During processing of salted radish, malic acid decreased, whereas pyroglutamic and lactic acids increased. AA

## POTATO

- 1116 GUNTER MATHEIS (G) and BELITZ (H-D). Multiple forms of soluble monophenol, dihydroxyphenylalanine. Oxygen oxidoreductase (EC 1.14.18.1) from potato tubers (*Solanum tuberosum*). IV. Association and dissociation phenomena. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 271-5

The soluble phenol oxidase of various potato juices (adjusted from physiological pH to pH 4.5, 7.0 and 7.8) was separated by gel chromatography into multiple molecular forms. In acid or neutral and alkaline potato juices, low-molecular weight (<150,000 daltons) or high-molecular-weight (>150,000 daltons) enzyme forms predominate respectively. Conversion of the low molecular weight enzyme forms into high-molecular weight enzyme forms and vice versa, was achieved by changing the pH values from acidic to neutral or alkaline pH and vice versa. This substantiated our previous idea that the enzyme multiplicity arises from association of various subunits. In alkaline potato juice, considerable loss of monophenol oxidase activity (measured at pH 6.0) occurred. This confirmed our previous findings that O-diphenol oxidase is more alkali-stable than monophenol oxidase. AA

## ALFALFA

- 1117 FIORENTINI (R) and GALOPPINI (C). Pilot plant production of edible leaf protein concentrates. I. Technological aspects. *Ind. Aliment.* 19(168); 1980; 11-5



A pilot plant has been set up to prepare edible leaf protein concentrates from alfalfa juice, by a wet fractionation process which permits separate recovery of chloroplastic and cytoplasmic proteins. Characteristic features of the process are (i) the use of an organic polyelectrolyte (Superfloc A 150) to recover the green pigmented protein, and (ii) coagulation of the chlorophyll-free soluble protein remaining in the supernatant by two different methods (heat and acid). The yields are higher if the method of heat coagulation is applied. However, if acid is used for coagulation, the whole process proceeds at room temperature, and gives highly functional protein products. The chemical-nutritional properties of the leaf protein so obtained, and its use in human nutrition will be discussed in another paper. KMD

## CAPSICUM

- 118 RAHMAN (FMM) and BUCKLE (KA). Pigment changes in capsicum cultivars during maturation and ripening. *J. Food Technol.* 15(3); 1980; 241-9

Employing chromatographic, spectroscopic and chemical methods, quantitative distribution of chlorophyll and carotenoids in five capsicum cultivars at four stages of maturation and ripening were assessed. Twelve, twelve, twenty nine and twenty six individual pigments were isolated and most of them were identified from immature, mature, half ripe and fully ripe capsicum cultivars respectively. The pigment composition data were found to be consistent with the proposed pathway of synthesis of red keto-carotenoids, capsanthin and capsorubin. Cultivars at different stages of maturation and ripening showed significant differences in concentration, although they showed the same visual colour. Except chlorophylls a and b, other lycopene and chlorophyll pigments were not present in any cultivar during any stage of maturation. BSN

## FRUITS

- 119 ITOO (S). Special qualities and utilization of tropical fruits. *J. Jpn. Soc. Food Sci. Technol.* 27(6); 1980; 311-22 (Japanese)

## DATE

- 120 SALIK (H), ROSEN (B) and KOPELMAN (IJ). Microbial aspects and the deterioration process of soft dates. *Food Sci. Technol.* 12(2); 1979; 85-7

The microbial deterioration process and shelf-life of soft dates was investigated. Lactic acid bacteria and yeast were found to be cause for the relatively short shelf-life of the product. Organoleptic rejection of the soft dates was attributed partially to the low pH developed during the storage. Organoleptic spoilage kinetics was quantitatively related to storage temperature, thus enabling one to predict shelf-life of soft dates stored under known variable time-temperature storage and handling conditions. AA

## CRANBERRY

- 121 GECAN (JS), SCHULZE (AE), CICHOWICZ (SM) and ATKINSON (JC). Mold in jellied and whole-berry styles of cranberry sauce. *J. Food Prot.* 42(4); 1979; 328-9



## GRAPE

- 1122 CLINGELEFFER (PR), MAY (P) and BRIEN (CJ). The effects of mixing turgid (blob) and dried sultanas during storage. *Food Technol. Aust.* 32(7); 1980; 332-5

Lots of 200 g of sultana raisins (11.7% initial moisture content) were mixed with 0,2,5,10,20 or 40 emulsion-treated sultana berries (berries : initial moisture content about 70%) and held in unsealed plastic bags for two months at room temperature. Only at 2% level of blending the moisture content equalised and both types of sultanas were light coloured, whereas with increase in the content of blobs the colour became darker and the blobs failed to dry. KAR

## LEMON

- 1123 ITO (Y), TOYODA (M), OGAWA (S), IWAIDA (M) and YANAGIDA (F). Occurrence of orthophenylphenol during manufacture of lemon marmalade. *J. Food Prot.* 42(4); 1979; 292-3

## MANGO

- 1124 NIRANKAR NATH and RANGANNA (S). Determination of thermal process schedule for totapuri mango. *J. Food Technol.* 15(3); 1980; 251-64

The values for thermal inactivation of pectinesterase (PE) in Totapuri mango syrup homogenate are  $F_{208.8}^{18.56} = 1.00$  and  $D_{208.8}^{21.4} = 0.456$  at pH 3.6. The F value is equivalent to 2.19 D. In commercial canning a 3 D process is recommended which is adequate to inactivate the PE, the natural microflora consisting of gram-positive and gram-negative nonsporulating rods and cocci, and the test organism *Clostridium pasteurianum* which is able to grow in mango preparations at pH 3.8 and above. *Bacillus coagulans* which causes flat-sour spoilage does not grow in mango preparations. Process times calculated by the graphical method are compared with the values found by formula method using six different procedures. Process requirements under different initial and processing temperatures are given. AA

## APPLE

- 1125 THONNISSEN (H). Intensive orcharding for cider apples - ensuring future raw material supplies for the fruit juice and fruit wine industries. *Flussiges Obst.* 46(6); 1979; 229-32

Since the Second World War, the cultivation of cider apples, has been steadily declining, while that of table apples has been increasing, in spite of the steady increase in the demand for apple juice or cider. After a study of the situation in W. Germany, France, England, and Switzerland, the author concludes that it is economical to grow cider apples only in large orchards of at least 4 hectares so that harvesting can be completely mechanized. It is also necessary to ensure that the risk of such an enterprise is shared by insisting on a purchase contract between the grower and the juice manufacturer. KMD

- 1126 WILLS (RBH), HOPKIRK (G) and SCOTT (KJ). Use of fatty acid methyl esters and edible fats and oils to reduce soft scald of apples. *J. Sci. Food Agric.* 31(7); 1980; 663-6

The compounds which reduce the soft scald that developed during cool



storage of apples are, methyl laurate, methyl palmitate, methyl stearate, methyl oleate, methyl linoleate, methyl linolenate, palm oil, safflower oil, sunflower oil, coconut oil, lard and lecithin. KAR

## SUGAR, STARCH AND CONFECTIONERY

### SUGAR

- 127 FRIEDEMANN (I). Increase of the utilization of carbon dioxide during the first carbonation. *Lebensmittel-Industrie*. 27(1); 1980; 22-6 (German)

In order to increase the utilization of carbon dioxide in the carbonation plants of the sugar industry, a jet carbonation process was tested on an industrial scale. The utilization factor could be raised to an average of 95 per cent, compared to the factor of only 65-75% obtained with the hitherto used bubble column. KMD

- 128 MATSUI (T). Chemical components of wasanbon-to sugars. *J. Jpn. Soc. Food Sci. Technol.* 27(6); 1980; 307-10 (Japanese)

Wasanbon-to sugar has been manufactured in Japan by unique traditional refining procedures but the differences of the unique flavour among products of Wasanbon-to has not been studied previously. In the present paper analysis of variance of chemical components for Wasanbon-to was studied by F-test. The sugar cane presses juice from Chikusha variety contained less free amino acids and reducing sugars but higher titratable acidity than did that from variety N: Co. The Wasanbon-to refined by manual processes contained less free amino acids, and more ash than that refined by centrifugation. AA

### STARCH

- 129 MEUSER (F), KLINGLER (RW) and NIEDIEK (EA). Separation of starch molecules by high pressure liquid chromatography. *Getreide Mehl Brot*. 33(11); 1979; 295-9

- 130 MULLER (Von H) and SIEPE (V). Quantitative determination of some mono and oligosaccharides in foods by high pressure-liquid chromatography. Substitution of the health endangering eluent acetonitrile-water with a mixture of healthwise unobjectionable solvents. *Dtsch. Lebensmittel-Rundsch.* 76(5); 1980; 156-61 (German)

An eluent mixture consisting of acetone, ethylacetate, and water (55: 30: 14 by vol.) was found to be more suitable for chromatographic estimation of mono and oligosaccharides than the previously used acetonitrile water mixture. The former is not only more safe, but also enables estimation of lower concentrations of saccharides, when various accessory techniques like degassing of the eluent, connection of two columns, and temperature control of the columns, of the eluate, and of the RT detector are employed. Methods for the rational preparation of the samples - such as extraction of the saccharides, desalting of the sample solution - have also been suggested. The efficiency of the method has been demonstrated by examples. KMD

- 131 PARAVENTI (R) and MACHIAVELLI (G). Starch. *Ind. Aliment.* 19(168); 1980; 1-10 (Italian)

This review paper first describes the chemical structure of starch clearly and then goes on to discuss its physical properties, its granules and their



organization, its properties of swelling and gelatinization, and the behaviour of starch in some food products, viz. baked goods and treated cereals. It is hoped that this information will help in the most advantageous use of starch in industry as well as in households. KMD

- 1132 SASAKI (T), SATO (Y), KOBAYASHI (T) and KAINUMA (K). Enzymatic conversion of cryomilled waste cellulose to glucose. *J. Jpn. Soc. Food Sci. Technol.* 27(6); 1980; 270-4 (Japanese)

The enzymatic conversion of cellulose in cryomilled newspaper has been investigated. X-ray diffractogram of the cryomilled waste cellulose to 250 mesh showed that it lost the crystalline structure. The degree of enzymatic hydrolysis of the cryomilled cellulose was about 60% at 72 hr by *Aspergillus niger* cellulase containing mainly 1,4- $\beta$ -glucan glucanohydrolase without action of 1,4- $\beta$ -glucan cellobiohydrolase. Chemical pretreatments (alkali, acid or acetone) for the cryomilled waste cellulose were less effective to increase the degree of enzymatic hydrolysis and the residual substrate in 40% yield was resistant to cellulase. These results suggest that the biological susceptibility of the waste cellulose does not depend on the degree of crystallinity but relates to lignin bound to the alkali treated waste cellulose. A problem on the resistant cellulose to enzymatic hydrolysis in waste cellulose are discussed. AA

#### CHOCOLATE

- 1133 MANIERE (FY) and DIMICK (PS). Effects of conching on the flavour and volatile components of dark, semi-sweet chocolate. *Food Sci + Technol.* 12(2); 1979; 102-7

The effects of conching time on the development and modification of flavour in dark, semi-sweet chocolates processed from beans roasted at different temperatures were investigated. Sensory tests were conducted by using a trained panel. Carbonyl analyses did not reveal a significant difference between the samples. It is possible that the compounds have been altered and rearranged so that the overall concentration remains unaltered. Analysis of headspace volatiles by gas chromatography demonstrated a decrease in the total amount of compounds generated, but the formation of new compounds was not evident. Mass spectrometry permitted identification of 56 components of the headspace volatiles, 44 of which were positively identified. KMD

- 1134 MUSSER (JC). The use of monoglycerides in chocolate and confectionery coatings. *Manuf. Confect.* 60(6); 1980; 69-80

#### SOHAAN

- 1135 GHAHRAMANI (F), EL SHAARAWY (MI) and MALEKY (M). Chemical and technological studies on the Iranian sweet 'sohaan'. *Ind. Aliment.* 19(168); 1980; 26-31 (Italian)

'Sohaun' is made in the following three stages: (1) wheat flour, malt, and water are mixed and heated to 80 C for 80 minutes to allow the malt enzymes to act; (2) sugar and part of the fat are added to this mixture which is boiled for 2 hour to inhibit the enzymes, evaporate water, and start caramelization; (3) the rest of the ingredients are added and the temperatures raised to 130 C for 30 minutes so that water is completely evaporated, and caramelization and polymerization proceed to the desired extent (in terms of colour and texture). If  $\alpha$ -amylase is substituted for malt, products of a poorer quality are obtained; thus, other amylolytic and proteolytic enzymes are also involved.



'Sohaani' passes through four rheological phases, represented by three behavioural patterns : thixotropic, dilatant and rheopectic. 'Sohaani' prepared with different fats did not show rancid flavour after one month of storage. The thiobarbituric acid test showed that 'ghee' is preferable to shortening, and addition of anti-oxidants to non-addition, for prolonged storage. However, one must take into account an accumulation of malonaldehyde and its subsequent decrease during storage. KMD

## BAKERY PRODUCTS

- 1136 DUBOIS (DK). Icings and glazes : Formulation and processing. *Cereal Food World*. 25(6); 1980; 302-7

Manufacture of flat roll icings and glazes, the ingredients, formulation, procedure, problems involved and precautions to be taken have been determined. KAR

- 1137 EMODI (A), JOHNSON (L) and MIX (J). Carotenoids in bakery products. *Cereal Food World*. 25(6); 1980; 316-8

$\beta$ -carotene at 3-12 mg/lb of dry white cake mix or 8 mg/lb of sweet cookie dough produced a nice, rich yellow colour in the baked goods. Crackers with good colour could be produced by adding 3-6 mg of apocarotenal per pound of cracker dough. KAR

- 1138 RASPER (CF) and DeMAN (JM). Effect of granule size of substituted starches on the rheological character of composite doughs. *Cereal Chem*. 57(5); 1980; 331-40

The study has shown that differences in water binding capacity and a few rheological parameters observed in dough making with starches from cassava, wheat, potato and yam, appear to have a more pronounced role in the physical quality of composite dough, than the particle size of the starches involved. BSN

## BREAD

- 1139 DAVIS (AB) and ROGERS (DE). Quality preservation in frozen rolls. Effect of rate and time of freezing. *Baker's Dig*. 54(2); 1980; 10-2

For getting an optimal frozen roll, freezing should begin as soon as practical after the crust moisture peak has been achieved and should occur as rapidly as possible. Once frozen the roll should be kept in cold and not thawed until needed for consumption. KAR

- 1140 DRAGSDORF (PD) and VARRIANO-MARSTON (E). Bread staling : X-ray diffraction studies on bread supplemented with  $\alpha$ -amylases from different sources. *Cereal Chem*. 57(5); 1980; 310-4

The effects of barley malt, fungal  $\alpha$ -amylase, and bacterial  $\alpha$ -amylase on starch crystallization and organization in staling breads were studied by x-ray diffraction. Comparison of x-ray patterns of fresh and stored breads showed an order of decreasing degree of starch crystallinity as follows: bread with bacterial  $\alpha$ -amylase, bread with cereal  $\alpha$ -amylase, bread with fungal  $\alpha$ -amylase, unsupplemented bread. Those results were in direct contradiction to bread firming data, indicating that starch crystallinity and bread firming are not synonymous. Starch crystalline organization also was affected by enzyme supplementation. Starches from breads containing bacteria enzyme supplements exhibited "V<sub>h</sub>" and "A" structures, whereas the control had "V<sub>h</sub>" and "B" structures. A possible role of starch crystal structure in bread firming was postulated. AA



- 1141 NAGAI (T), IMAMURA (H) and KIRIYAMA (S). Dietary fiber breads containing gobo residue, gobo holocellulose, and Konjac powder. *Cereal Chem.* 57(5); 1980; 307-10

Bread was made from mixtures (95:5, 90:10 and 85:15) of hard wheat flour and one of three fibrous materials; gobo residue, gobo holocellulose, and konjac powder. In the dough, the gobo residue caused a slight increase in water absorption. The gobo holocellulose increased absorption markedly at the 10 and 15% replacements, and the konjac powder caused the greatest increase in absorption. The bread containing 5% gobo residue or konjac powder did not differ significantly in loaf volume from the control, but reductions in loaf volume were observed at the 10 and 15% levels. The gobo holocellulose at the 5% level severely reduced loaf volume. At all the replacement levels, konjac powder gave the softest bread, gobo holocellulose the hardest, and gobo residue the coarsest. The konjac powder had the least effect on colour, and the gobo residue had the greatest. Bread containing 5% gobo residue or konjac powder did not differ significantly from a control bread in loaf volume, crumb texture, and taste. AA

- 1142 POMERANZ (Y). Molecular approach to breadmaking : An update and new perspectives. *Baker's Dig.* 54(2); 1980; 12-20, 24

Topics discussed include interaction of lipids, proteins and starch in bread making, interaction of starch and lipid in bread staling, antistaling agents, microscopic studies of wheat components and the quality of doughs prepared from good and poor quality flours. KAR

- 1143 SHUEY (WC), MANEVAL (RD) and DICK (JW). Dual-purpose mill for flour and granular products. *Cereal Chem.* 57(5); 1980; 295-300

A 55 cwt pilot mill originally designed and flowed to produce bread wheat flour was modified to increase the purifier surface by 300%. After modification, the mill could produce either a granular or a fine flour product, depending on the mode of operation. Conversion from one mode to the other required about 2 hr and involved changing some of the gaps between rolls, sieve sizes, and stream flows. Roll types or corrugations were not changed. Total flour extraction ranged from 72 to 80%, depending on the wheat lot. Farina of 30-35% extraction was produced when the mill was converted to produce a granular product with a total extraction of 75-78%. The average particle size distribution of the product was 4.3, 43.3, and 44.1% over No. 20 W, 30 W, and 40 W, respectively, and 8.3% through No. 40 W. The percent extraction of semolina from 10 different varieties ranged from 56.3 to 65.4% with an average extraction of 60.0%. The average granulation of the semolina was 3.1, 72.7, 16.8 and 4.8% over No. 40 W, 60 W, 80 W, and 100 W respectively, and 2.6% through No. 100 W. The ash content of the semolina ranged from 0.498 to 0.614% with an average of 0.553%. AA

- 1144 STENVERT (NL), MOSS (R) and BOND (EE). No-time dough : Formulation and processing interaction. *Getreide Mehl Brot.* 33(11); 1979; 302-7 (German)

Some important aspects of bread manufacture using 'No Time Dough' with conventional kneading machines have been studied. The need for large doses of oxidising agents in this process has been reviewed. One can, however, obtain the technical modifications using reducing agents. The time span between the kneading and further working has a considerable effect on the quality of bread. The cause of this could be proved microscopically. The effect of dough working after kneading, on the quality of bread has been discussed and in extreme cases it was possible with the help of roll-out machines, to manufacture bread with a conventional 'No Time Dough', which corresponds qualitatively to a bread with mechanical dough development. The 'No Time Dough' has a great tolerance when compared to the other methods of manufacture. KMD



## COOKIE

- 1145 RANHOTRA (GL). Nutritional profile of high-protein cookies. *Cereal Food World*. 25(6); 1980; 308-9
- 1146 VECCHIONACCE (LM) and SETSER (CS). Quality of sugar cookies fortified with liquid cyclone processed cotton seed flour with stabilizing agents. *Cereal Chem.* 57(5); 1980; 303-6
- Eating quality of sugar cookies fortified with 0, 12, 24, 36 and 48% liquid cyclone processed cottonseed flour (CSF) and containing 1% sodium-stearoyl-2 lactylate or 1% xanthan gum was evaluated. Eating quality scores were highest for cookies with 12 and 24% CSF, but cookies with 36 and 48% were acceptable. Sodium-stearoyl-2 lactylate generally gave higher, but not significantly higher, cookie scores than did xanthan gum. CSF, when used at all levels except the 48% level, improved tenderness and overall acceptability scores after one and two months' storage. Protein levels were increased from 6 to 15.6% with the addition of CSF, but protein quality was not improved, as shown by chemical scores and protein efficiency ratio values of the cookies in combination with casein. AA

## CAKE

- 1147 MIZUKOSHI (M), MAEDA (H) and AMANO (H). Model studies of cake baking. II. Expansion and heat set of cake batter during baking. *Cereal Chem.* 57(5); 1980; 352-5
- Gas release, protein coagulation and cessation of batter expansion and gelatinization in sponge cakes occurred at the same temperature. An ideal equation for bubble expansion in cake batter during baking has been proposed. The equation suggests a close relationship between bubble volume, saturated vapour pressure and temperature. BSN
- 1148 NUNEZ (MA) and MAGA (JA). The sensory and functional properties of 'arepas' made from extruded iron-fortified corn flour. *Food Sci + Technol.* 12(2); 1979; 65-7
- The sensory properties of 'arepas' or corn-cakes made from stored Venezuelan flour both unfortified and fortified with iron - were compared to those of arepas produced by extrusion of corn flour. Significant differences in acceptability, texture and flavour were found between the extruded flour and non-extruded flour; but the differences between the fortified and unfortified flours were insignificant. A comparison of the gelatinized material from the extruded and nonextruded flours showed that the extruded flours had better functional characteristics. KMD

## MACARONI

- 1149 RAYMAN (MK), D'AOUST (JY), ARIS (B), MAISHMENT (C) and WASIK (R). Survival of micro-organisms in stored pasta. *J. Food Prot.* 42(4); 1979; 330-4
- A study of the survival of several microorganisms in artificially contaminated pasta stored at room temperature, led to the conclusion that *Streptococci* are more reliable than *E. coli* as indicators of fecal contamination in pasta. Detection of *Salmonella infantis* and *Salmonella typhimurium* after 360 days indicates that prolonged storage of pasta is not effective for decontamination of infected products. KMD



## MILK AND DAIRY PRODUCTS

- 1150 BADINGS (HT) and NEETER (R). Recent advances in the study of aroma compounds of milk and dairy products. *Neth. Milk Dairy J.* 34(1); 1980; 9-30  
The progress made in the field of aroma compounds in milk and dairy products has been reported. In several cases the correlation between the analytical data of flavour composition and the sensory properties of dairy products can be determined. Compounds which contribute to desirable and undesirable flavours in milk, milk powder, cultured dairy products, cream and butter, and cheese have been listed. The available knowledge may be used for restoring flavour lost during processing of dairy products by adding nature-identical flavour compounds or by fortifying the flavour of dairy products which are used as additives in other food products. KMD
- 1151 BISHOP (JR), BODINE (AB) and JANZEN (JJ). Effect of ambient environments on survival of selected bacterial populations in dairy waste solids. *J. Dairy Sci.* 63(4); 1980; 523-5
- 1152 DAVE (HR) and SHAH (US). Venturi scrubbers for spray drying plants. *Indian Dairyman.* 32(12); 1980; 883-6  
Feasibility of using venturi scrubbers with spray dryers has been demonstrated. The constructional features; principles of operation; efficiency in power recovery; and microbiological aspects of venturi scrubbers have also been covered. MVG
- 1153 DEDEK (M), LUKAS (A) and TEPLY (M). New trends in the cultivation and application of pure cultures in dairy industry. Part II. *Prumysl Potravin.* 30(6); 1979; 324-6
- 1154 HEDRICK (TI) and CHANDAN (RC). Reducing dairy plant costs and improving efficiency. *Indian Dairyman.* 32(12); 1980; 873-7  
Cost reduction at various stages of plant operation and maintenance, importance of keeping records to effect cost reduction, and the methods of effecting efficiency have been outlined. MVG
- 1155 RANGANATHAN (B) and KULKARNI (SS). Role of micro-organisms in the utilization of dairy wastes. *Indian Dairyman.* 32(12); 1980; 889-92  
Utilization of whey in the production of beverages; single cell protein; and production of beverages from buttermilk are the aspects covered. MVG

## MILK

- 1156 BACHMANN (M) and LEUEN BERGER (N). Preservation and commercialization of milk by means of adapted technology and use of solar energy. *Food Sci + Technol.* 12(2); 1979; 124-6  
New methods of milk preservation have been developed in Switzerland, for use by the nomads in Afghanistan. Milk (cow's or sheep's) is converted into the traditional products, viz., ghee and a low-fat white cheese having a slightly sour and salty taste. The processed white cheese was tasty, and had a smooth texture. Cheese sausages could be stored for 2 months or more at room temperature (22-25 C) and 40-60% RH. The equipment specially designed for this process consisted of a sun-heated cheese vat, and a hand operated cheese-melting kettle. In addition, a big, hand-operated shredder or mincer for cheese and a sausage filter were also required. The most difficult part of the operation was the introduction of the unconventional processed cheese sausage on the local market. KMD



- 1157 DILL (CW), HERLICK (SA), RICHTER (RL) and DAVIS (JW). Fat test depression during chilled storage of milk samples in plastic containers for analysis by the milko-tester. *J. Food Prot.* 42(4); 1979; 314-6  
 Ambiguous depressions in fat tests were observed when milk samples were stored before testing by the milko-tester procedure. Fat-test depression was augmented by shipping and by chilling samples at the time of collection in an ice-water mixture. The effect was greatest in samples stored in 1-l plastic containers and in partially filled plastic bags. The fat-test depression was not significant in samples stored in glass bottles or in plastic containers receiving no refrigeration during the storage period. AA
- 1158 GANGULI (NC) and BHAVADASAN (MK). Useful use of urea in milk. *Indian Dairyman.* 32(12); 1980; 879-81  
 Aspects covered include early work done on urea levels and heat stability of cow milk and buffalo milk; heat stability of urea enriched buffalo milk; and addition of urea and its implications under Prevention of Food Adulteration Act of India. MVG
- 1159 GINGRICH (BL) and DIMICK (PS). Effect of ingredient formulation on the quality of milk caramels. *Food Sci + Technol.* 12(2); 1979; 108-14  
 Fifteen formulations of milk caramel were prepared with variation in; (a) amount of butterfat; (b) fat source-whether coconut oil melting at 76 C or 100 C was used; (c) sugar sources and ratios-varying proportion of corn syrup solids (CSS) to sucrose, and use of high-fructose corn syrup (HFCS); and (d) protein sources-utilization of sweet dry whey and a soya protein isolate to replace milk-solids-not-fat (MSNF). Organoleptic tests by a trained panel showed that: (i) butterfat imparts certain desirable flavours, but need not be the sole fat source; (ii) the moisture levels and extent of browning can be adjusted by manipulating the sugar content; (iii) the type of protein used can influence water-binding capacity and stand-up ability; and (iv) use of less expensive ingredients such as HFCS and whey solids is feasible and may even be desirable. KMD
- 1160 KIRST (E). Lipolytic processes in milk and dairy products. Literature survey and investigations on the influence of stirring and pumping on milk fat. *Lebensmittel-Industrie.* 27(1); 1980; 27-31 (German)  
 The effects of technological processes (mainly pumping) on milk have been followed by measuring the content of 'free' fat and free fatty acids. Other analytical possibilities of assessing such changes have been briefly mentioned. The effects of various stirrers and pumps on the structure of milk fat have been described. KMD
- 1161 KOOPS (J) and WESTERBEEK (D). Rapid routine determination of the lead content of sterilized canned evaporated milk by flameless atomic absorption spectrophotometry. *Neth. Milk Dairy J.* 34(1); 1980; 31-41  
 A rapid method for the determination of Pb in sterilized, canned, evaporated milk (SCEM) by flameless atomic absorption spectrophotometry is described. Representative weighed samples (300 µl) of sterilized canned evaporated milk are diluted with a solution of ammonium nitrate and injected by an autosampling system into a zirconium coated graphite tube. Peak heights are compared with those of standards having the same milk matrix. Average values found for Pb in twelve samples of SCEM agree with those obtained by a spectrophotometric (dithizone) procedure. AA
- 1162 LERK (CF), BUMA (TJ) and ANDREAIE (AC). The effect of mechanical treatment on the properties of lactose as observed by differential scanning calorimetry. *Neth. Milk Dairy J.* 34(1); 1980; 69-73



The experiments reported here were set up to investigate the effect of grinding and of compaction on the properties of lactose, as observed by differential scanning calorimetry. Both grinding and compaction of  $\beta$ -lactose and of stable anhydrous  $\alpha$ -lactose resulted in decreasing melting temperatures with increasing grinding and compaction times. Stable anhydrous  $\alpha$ -lactose also exhibited considerable changes in the extent of the endothermic effects. These effects have been illustrated with the help of thermograms. KMD

- 1163 MA (CY) and NAKAI (S). Carboxyl-modified porcine pepsin: Properties and reactions on milk and caseins. *J. Dairy Sci.* 63(5); 1980; 705-14
- 1164 PATTON (S), LONG (C) and SOKKA (T). Effect of storing milk on cholesterol and phospholipid of skim milk. *J. Dairy Sci.* 63(5); 1980; 697-700
- As a measure of milk fat globule membrane stability we evaluated increases in cholesterol and phospholipid of the skim milk phase resulting from 24 h aging of milks at 2 to 4 C. Samples of bovine milks showed no net increase in cholesterol and a small increase (10%) in phospholipid of the skim milks. Four samples of caprine milks from two animals revealed substantial increases in cholesterol (89%) and phospholipid (29%) in skim milks from aging the milks. Losses of the two membrane lipids from the bovine (but not the caprine) milk fat globule are relatively small for 24 h following milking. Bovine skim milks of lowest lipid content are obtained by separating fresh rather than aged milks. AA
- 1165 RICHTER (RL), BRANK (WS), DILL (CW) and WATTS (CA). Ascorbic acid stimulation of diacetyl production in mixed-strain lactic acid cultures. *J. Food Prot.* 42(4); 1979; 294-6
- 1166 ROSKOSZ (A), BREZINA (P), DOLEZALEK (J) and PRIKRYL (F). Changes of the amount of digestible lysine due to condensing nonsweetened milk. *Prumysl Potravin.* 30(6); 1979; 342 (Czech)
- 1167 SCHRAMEL (P). Determination of boron in milk and milk products by ICP-analysis. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 255-8 (German)

#### COW MILK

- 1168 ALLEN (JC) and MILLER (WJ). Selenium binding and distribution of goat and cow milk. *J. Dairy Sci.* 63(4); 1980; 526-31
- 1169 GRANT (DR) and PATEL (PR). Changes of protein composition of milk by ratio of roughage to concentrate. *J. Dairy Sci.* 63(5); 1980; 756-61
- 1170 MAUS (RW), MARTZ (FA), BELYEA (RL) and WEISS (MF). Relationship of dietary selenium to selenium in plasma and milk from dairy cows. *J. Dairy Sci.* 63(4); 1970; 532-7
- 1171 ROBINSON (JL). Bovine milk orotic acid : variability and significance for human nutrition. *J. Dairy Sci.* 63(5); 1980; 865-71
- 1172 VAN DER HAVE (AJ), RINSKE DEEN (J) and MULDER (H). The composition of cow's milk. 5. The contribution of some milk constituents to the freezing-point depression studied with separate milkings of individual cows. *Neth. Milk Dairy. J.* 34(1); 1980; 1-8
- Contributions (in °C) of lactose, chlorides and phosphates to the freezing point depression of milk have been calculated for separate milkings. The



sum of the contributions is fairly constant. In one case a downward trend has been observed. The freezing point depressions of morning milk and evening milk have also been compared. The sum of the contributions of milk constituents does not show significant differences. KMD

## CASEIN

- 1173 EL-NEGOUMY (AM). Effect of sodium dodecyl sulfate binding temperature on molecular weights of  $\alpha_s$ - $\beta$ - and  $\kappa$ -caseins. *J. Dairy Sci.* 63(5); 1980; 825-9

- 1174 HELESICOVA (H) and PODRAZKY (V). Properties of acid casein. *Prumysl Potravin.* 30(6); 1979; 338-41 (Czech)

- 1175 KAMINOGAWA (S), YAMAUCHI (K), MIYAZAWA (S) and KOGA (Y). Degradation of casein components by acid protease of bovine milk. *J. Dairy Sci.* 63(5); 1980; 701-4

Degradation of  $\alpha_{s1}$ -,  $\beta$ -, and  $\kappa$ -caseins by an acid protease of bovine milk was studied by disc and urea-sodium dodecyl-sulfate electrophoresis. The acid protease converted  $\alpha_{s1}$ -casein into a fragment, with a mobility equal in both disc and urea-sodium dodecylsulfate electrophoresis to that of  $\alpha_{s1}$ -1 casein produced by the action of chymosin. New bands, with mobilities equal in disc and urea-sodium dodecylsulfate electrophoresis to those of  $\beta$ -1 and  $\beta$ -11 fractions produced by chymosin action, appeared by the action of acid protease on  $\beta$ -casein. Furthermore, a para- $\kappa$ -casein-like protein was formed from  $\kappa$ -casein by the acid protease. However, the para- $\kappa$ -casein-like protein was formed much slower by the acid protease than was para- $\kappa$ -casein by chymosin. AA

- 1176 SCHMIDT (DG). Colloidal aspects of casein. *Neth. Milk Dairy J.* 34(1); 1980; 42-64

The properties of the main casein constituents are briefly summarized. The properties of the casein micelles largely determine the behaviour of milk during technological processes such as pasteurization, sterilization, concentration and curdling for cheese manufacture. Attention is also given to the phenomena of heat stability of milk and of age-thickening of UHT-sterilized milk, which are closely related to the behaviour of the casein micelles. KMD

## BUTTER

- 1177 BOARD (PW), AICKEN (K) and KUSKIS (A). Measurement of the spreadability of margarine and butter using a single pin maturometer. *J. Food Technol.* 15(3); 1980; 277-83

Single pin maturometer (SPM) readings were taken on samples of margarine and butter having temperatures in the range 0-25 C. The spreadability of the same samples at the same temperatures was also assessed by a panel of twenty adults using an hedonic scoring scale. The SPM readings and scores for spreadability varied markedly with the type of product and its temperature. The temperature corresponding to maximum scores for spreadability for a hard margarine and butter was about 20 C and for a soft butter was about 15 C. A soft margarine received scores of more than 6(= very good) on the 7 point hedonic scale over the temperature range 0-10 C and the data indicated that spreadability may also be 'very good' at temperatures just below 0 C. The SPM reading corresponding to the maximum score for spreadability was about 100 g for all samples. The SPM was shown to be suitable for the routine assessment of the spreadability of margarine and butter. AA



## GHEE

- 1178 CHAKRABARTY (PM), BHATTACHARYYA (D), GAYEN (AK) and CHAKRABARTY (MK). Argentan silica gel thin layer chromatographic detection of adulteration of butter fat (ghee). *Sci. Cult.* 46(9); 1980; 336-7

A simple and rapid method for detecting hydrogenated groundnut oil, mahua oil and tallow added as adulterants at 5% level to butter fat (ghee) is described. The method is based on separation of total glycerides after rearrangement reactions by silver ion silica gel TLC. MVG

## WHEY

- 1179 STIEBER (RW) and GERHARDT (P). Production of *Lactobacillus* cells by dialysis continuous fermentation of deproteinized whey. *J. Dairy Sci.* 63(5); 1980; 722-30
- 1180 THOMPSON (LU) and REYES (ES). Modification of heat coagulated whey protein concentrates by succinylation. *J. Dairy Sci.* 63(5); 1980; 715-21

## CHEESE

- 1181 BUMA (TJ). Viscosity and density of concentrated lactose solutions and of concentrated cheese whey. *Neth. Milk Dairy J.* 34(1); 1980; 65-8

The viscosities of concentrated lactose solutions and of concentrated cheese whey have been estimated in the temperature range of 20 - 60 C using an ostwald viscometer. The results show that viscosities and density of concentrated cheese increase with concentration but decrease as the temperature rises. The viscosity of concentrated whey is much higher than that of a lactose solution of the same concentration and temperature. KMD

- 1182 CHEN (FH), BASSETTE (R) and MARSHALL (JT). A milk-like beverage from neutralized direct-acid-set cottage cheese whey. *J. Food Prot.* 42(4); 1979; 299-301

An imitation milk was formulated by combining 4 parts of neutralized, direct-acid-set cottage cheese whey with 6 parts of whole milk, and fortifying with 0.5% dry milk solids (NFD). Two formulations, having 2.0 and 3.25% fat respectively could be prepared at a saving of 35 and 25 cents per gallon, respectively. There was a detectable difference in the taste of the imitation milk, when compared to that of standard milk. The imitation milk had a lower content of total solids and of protein than standard milk. KMD

- 1183 LAFONT (F), SIRIWARDANA (MG), COMBEMALE (I) and LAFONT (J). Mycophenolic acid in marketed cheeses. *Food Cosmet. Toxicol.* 17(2); 1979; 147-9

Analysis of a total of 100 samples of blue-moulded cheese showed that 38 contained mycophenolic acid, three at levels higher than 10 ppm. This contamination is particularly frequent in some types of cheese, and is due to the use, in their manufacture, of those *Penicillium roqueforti* strains that produce a high yield of mycophenolic acid in vitro. AA

- 1184 LEE (HJ), OLSON (NF), and LUND (DB). Diffusion of salt, fatty acids, and esterases in mozzarella cheese. *J. Dairy Sci.* 63(4); 1980; 513-22



## MEAT AND POULTRY

- 185 CAVOSKI (D), FRIDL (T), JOSIPOVIC (S) and LIPPMANN (G). Influence of the composition of dry curing mixture on the curing process of dried cured meat products. *Technol. Mesa.* 20(12); 1979; 348-52 (Serbo-Croat)
- 186 ILIC (K). Changes of inside can surfaces during the long-term storage of canned meats produced by addition of various soya preparations. *Technol. Mesa.* 20(12); 1979; 356-8 (Serbo-Croat)
- 187 LUCIC (D) and SIMIC (N). Effect of salt, nitrites, nitrates and phosphates in canned meats on aluminium can corrosion. *Technol. Mesa.* 20(12); 1979; 353-5 (Serbo-Croat)
- 188 PIERSON (MD), SMOOT (LA) and STERN (NJ). Effect of potassium sorbate on growth of *Staphylococcus aureus* in bacon. *J. Food Prot.* 42(4); 1979; 302-4  
 Bacon with 0.13 and 0.26% potassium sorbate and no nitrite was most effective in suppressing growth of *S. aureus* through 14 days of storage at 27 C. When stored at 13 C, bacon containing nitrite and potassium sorbate exhibited lower numbers of *Staphylococci* after 7 days than did the bacon containing potassium sorbate alone. KMD
- 189 SCHIEFER (G) and SCHONE (R). Manufacture of pickled (i.e. salted) meat products by means of starter cultures. *Nahrung.* 23(9-10); 1979; 915-9 (German)  
 After dealing with theoretical problems related to curing, the authors discuss the use of starter cultures in the manufacture of salted meat. Apart from increasing production starter cultures are also able to meet some consumer requirements. Data reported in the literature as also the results of the authors' own work, would lend support to the increased use of starter cultures in the manufacture of salted meat. KMD
- 190 STAN (H-J) and HOHLS (FW). Determination of trenbolone and testosterone residues in meat by high pressure liquid chromatography. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 266-70 (German)
- 191 TADIC (R). Application of additives to meat industry in Yugoslavia and in the world. *Technol. Mesa.* 20(12); 1979; 338-43 (Serbo-Croat)
- 192 TAYLOR (AA), SHAW (BG) and JOLLEY (PD). A modern dry-salting process for Wiltshire bacon. *J. Food Technol.* 15(3); 1980; 301-10  
 Bacon made by a 5-day process using brine injection followed by dry-salting has been compared with that made by a longer conventional Wiltshire process. The eating quality and appearance of the two bacons were similar. The slightly poorer storage stability of dry-salted back in vacuum packs was attributed to a low salt concentration which could be corrected by increased brine injection in this region. Dry-salting slightly improved the storage stability of collar in vacuum packs because initial bacterial counts were lower than in the immersion-cured. Comparison of dry-salted bacons made with and without nitrate in the injection brine showed that nitrate did not affect nitrite level during vacuum-packed storage. AA



## BEEF

- 1193 HECHT (SS), GRABOWSKI (W) and GROTH (K). Analysis of faeces for benzo(a)pyrene after consumption of charcoal-broiled beef by rats and humans. *Food Cosmet. Toxicol.* 17(3); 1979; 223-7

- 1194 MADOVI (PB). Changes in the free-NH<sub>2</sub>, free-CO<sub>2</sub>H and titratable acidity of meat proteins. *J. Food Technol.* 15(3); 1980; 311-8

The 2, 4, 6-trinitrobenzene sulphonic acid (TNBS) spectrophotometric assay and formol titration were used to measure changes in free-NH<sub>2</sub> and free-CO<sub>2</sub>H respectively, in meat proteins dissolved in 3% sodium dodecyl sulphate (SDS). Changes in the titratable acidity of the meats was also determined. The free-NH<sub>2</sub> groups were found to decrease markedly with cooking while-CO<sub>2</sub>H remained relatively constant. Intermediate moisture beef (*Longissimus dorsi*) processed and stored at 38 C showed the free groups increasing for up to 8 weeks storage due to proteolysis, followed later by a sharp fall due to cross-linking. But titratable acidity of the IM beef samples continued to rise with storage. AA

## PORK

- 1195 CHRISTOPHER (FM), VANDERZANT (C), CARPENTER (ZL) and SMITH (GC). Microbiology of pork packaged in various gas atmospheres. *J. Food Prot.* 42(4); 1979; 323-7

Boneless pork roasts were vacuum-packaged, one group remained vacuum-packaged (controls) while other groups were injected with 6 different gas mixtures. Roasts were stored from 0 - 35 days at 1-3 C, and samples from each group were observed under retail conditions for 5 days. Only rarely was any statistically significant difference observed in the psychrotrophic and lactobacillus counts of roasts stored in different ways. The initial microbial flora of the roasts consisted of *Pseudomonas* and *Lactobacillus* spp. *Pseudomonas* spp. remained a significant part of the microflora of roasts stored in 100% O<sub>2</sub>, whereas lactic acid bacterial (*Lactobacillus* and *Leuconostoc* sp) predominated on roasts after one week in all other atmospheres. KMD

- 1196 OLUSKI (V) and OLUSKI (T). Diseases of adaption in pigs and deaths caused by transport. *Technol. Mesa.* 20(12); 1979; 344-7 (Serbo-Croat)

- 1197 SEIDEMAN (SC), CARPENTER (ZL), SMITH (GC), DILL (CW) and VANDERZANT (C). Physical and sensory characteristics of pork packaged in various gas atmospheres. *J. Food Prot.* 42(4); 1979; 317-22

196 boneless pork roasts were vacuum-packaged, and 28 such packages were retained as controls. The others were divided into 6 groups of 28 packages each, and each different gas mixture was injected into the bags of each group. Roasts containing a high percentage of O<sub>2</sub> developed off-odour after 14 and/or 21 days, and had lower appearance ratings as well. Other data suggest that a modified gas atmosphere of 20% CO<sub>2</sub> + 80% N<sub>2</sub> is a suitable alternative to vacuum-packaging. KMD

## HOG

- 1198 KOPECKY (O). Grading criteria applied to purchased live hogs. *Prumysl Potravin.* 30(6). 1979; 312-3 (Czech)



## POULTRY

- 1199 JONES (HB) Jr. Energy use and costs in poultry rendering plants in the south. Univ. Georgia Coll. Agric. Exp. Stat. Res. Bull. 248; Jan 1980

## CHICKEN

- 1200 GARDNER (FA), HOPKINS (W) and DENTON (JH). A comparison of consumer methods of storing chicken broilers at home. *Poult. Sci.* 59(4); 1980; 743-7  
 Broiler carcasses purchased from retail source were placed at 4 C and were observed for one, five and eight days of storage. Results indicated that there was little benefit derived from opening the retail package prior to storage; repackaging resulted in small increase in bacterial load. There was no improvement in product shelf-life that could be associated with the repackaging process. However, washing the carcasses in cold tap water prior to repackaging and subsequent storage resulted in a decrease in initial bacterial numbers and a subsequent increase in product shelf life. KAR
- 1201 LANE (RH), MUIR (WM) and MULLINS (SG). Correlation of minimum sensory doneness with internal temperature of deep fat fried chicken thighs. *Poult. Sci.* 59(4); 1980; 719-23  
 Breaded raw chicken thighs, were deep fat fried at 163 C to internal end-point temperature of 88-90 C. Results of sensory evaluation indicated that minimum sensory doneness corresponded with an internal thigh temperature of 93 C and a fry time of 14.5 minutes. KAR
- 1202 LEESON (S) and SUMMERS (JD). Production and carcass characteristics of the broiler chicken. *Poult. Sci.* 59(4); 1980; 786-98  
 In this study an attempt has been made to obtain fundamental details such as weekly changes in growth rate, feed intake, and carcass composition of chicken reared on commercial diets over a 70-day study. The data are presented as a base for researchers concerned with model building and systems production. KAR
- 1203 TO (EC) and ROBACH (MC). Potassium sorbate dip as a method of extending shelf life and inhibiting the growth of *Salmonella* and *Staphylococcus aureus* on fresh, whole broilers. *Poult. Sci.* 59(4); 1980; 726-30  
 The refrigerated shelf life of fresh whole broilers at 3 C was extended by dipping freshly chilled carcasses in a 5% (w/w) solution of potassium sorbate for 1 minute. No spoilage was observed in sorbate treated birds until the 14th or 15th day. Dipping in sorbate also reduced the growth of *Salmonella* and *Staphylococcus aureus* inoculated on to the broilers. KAR

## DUCK

- 1204 JEORCH (H). The fattening and slaughtering yield, the nutrient content in the meat, and nutritional-economic data of the Muscovy duck (*Cairina moschata domestica*), compared to the young fat duck, and the young fat goose. *Nahrung.* 23(9-10), 1979, 943-7 (German)  
 The Muscovy duck, which has not yet been genetically developed for meat production, produces a meat which is better for the consumer than that of the existing breeds of ducks and geese used for fattening. It has a notably higher proportion of breast meat than the fattened duckling or gosling. Its consumption of energy and crude protein per unit and weight increase is not less favourable than that of the duckling or gosling. Better values could probably



be obtained by improving the breed and determining the exact nutrient requirements of either sex. KMD

## QUAIL

- 1205 SINGH (RP) and SHRIVASTAV (AK). A note on preparation of tandoori quail *Indian Poult. Gaz.* 64(3); 1980; 104-5  
The recipe for tandoori quail and the method of preparation are described. KMD

## EGG

- 1206 CHAND (D). A note on egg yolk cholesterol content in various avian species. *Indian Poult. Gaz.* 64(3); 1980; 97-100  
The different avian species, in increasing order of egg yolk cholesterol concentration (mg/g yolk) were, white leghorn chicken (20.61), Japanese quail (21.78), turkey (22.84), duck (26.23) and pigeon (34.28). The differences in concentration of egg yolk cholesterol of chicken, quail and turkey were non-significant and so was with duck and turkey. Pigeon egg yolk cholesterol was significantly higher than that of all other species studied. KMD
- 1207 HEATH (JL), OWENS (SL) and GOBLE (JW). Ultrasonic vibration as an acid in the acetic acid method of cleaning eggs. *Poult. Sci.* 59(4); 1980; 737-42  
To determine whether ultrasonic vibration could be beneficial for penetration of the cleaning solution into the egg, shell thickness, shell cleanliness, interior quality and microbial, organoleptic and functional properties were measured. Shell penetration was less, as a result of ultrasonic vibration, when the egg and acetic acid solution were at the same temperature (22 C) at time of washing than when the eggs were at 22 C and the solution was either at 12 or at 32 C. When egg and cleaning solution were 22 C no cleaning solution penetrated the shell after 5, 10, 20, 40 and 80 seconds of exposure but penetration increased after 160 and 320 seconds of exposure. KAR
- 1208 MONDAL (SS), CHAKRABARTI (S) and KHAN (AG). A note on egg quality traits in White Leghorn strain cross. *Indian Poult. Gaz.* 64(3); 1980; 101-3  
Non-significant differences for egg quality parameters were estimated among three interstrain cross pullets of White Leghorn breed. Significant correlation of egg weight with Haugh unit and albumin index were estimated for the P x M (first letter denotes sire and second dam line) genotype. N x P cross bred pullets showed statistically significant correlation between shell thickness and Haugh unit/egg weight. Albumin index and yolk index were significantly associated in P x M and N x P genotype. KMD
- 1209 TSUTSUI (T) and OBARA (T). Effect of succinylation on the emulsifying properties of egg yolk protein components. *J. Jpn. Soc. Food Sci. Technol.* 27(6); 1980; 293-7 (Japanese)  
It was reported that N-succinylation of egg yolk was effective for improving its emulsifying properties. To investigate this effect, egg yolk LDL (Low Density Lipoprotein) and HDL (High Density Lipoprotein) were succinylated at three different degrees. While succinylated LDL showed almost the same turbidity as intact LDL, the viscosity of 87.5% succinylated LDL was 1.3~1.4 times as high as that of intact LDL. Emulsifying activity of LDL decreased by succinylation, on the other hand, emulsifying capacity and emulsion stability of LDL increased with an increase of the degree of succinylation. Succinylated HDL showed almost the same turbidity as intact HDL in 2% NaCl solution.



The viscosity of 92.1% succinylated HDL was 2.0~2.4 fold over that of HDL. Emulsifying capacity of succinylated HDL hardly increased, but emulsion stability of HDL increased with an increase of succinylation. AA

## SEAFOODS

- 1210 EISENBERG (M), MALLMAN (R) and TUBIASH (HS). Polychlorinated biphenyls in fish and shellfish of the chesapeake bay. *Marine Fish. Rev.* 42(2); 1980; 21-5
- 1211 HUDGINS (LL). Per capita annual utilization and consumption of fish and shellfish in Hawaii, 1970-77. *Marine Fish. Rev.* 42(2); 1980; 16-20

## FISH

- 1212 AITZET MÜLLER (K) and ARZBERGER (E). Analysis of food dyes E 110, E 111 and E 124 in fish samples by ion pair partition HPLC. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 335-8
- 1213 CATTANEO (P) and CANTONI (C). Identification of different species of fish by electrophoresis on cellulose acetate. *Ind. Aliment.* 19(168); 1980; 21-5 (Italian)

Electrophoresis on cellulose acetate can show up not only quantitative, but also qualitative differences in the soluble protein fractions of the muscle tissue of different fishes. Hence, this method is very valuable for the identification of the fish species from which prepared products such as fillets have been made. If authentic fish muscle samples are used as standards, it is possible to identify unknown samples with accuracy. The method is specially useful in distinguishing between fisherwoman frogs and (puff?) ball fish; the latter can have lethal consequences if it is not adequately prepared. KMD

- 1214 KRUSE (R). Determination of total mercury in fish by means of a digestion method with  $\text{HNO}_3/\text{HClO}_3/\text{HClO}_4$  which does not lead to low results. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 259-62 (German)
- 1215 MOSSANDA (K), PONCELET (F), FOUASSIN (A) and MERCIER (M). Detection of mutagenic polycyclic aromatic hydrocarbons in African smoked fish. *Food Cosmet. Toxicol.* 17(2); 1979; 141-3

The mutagenicity of six polycyclic aromatic hydrocarbons found in African smoked fish was tested using several *Salmonella typhimurium* strains. In the presence of fortified rat-liver post-mitochondrial fractions, mutagenic activity was observed with o-phenylenepylene, coronene, benzo (g,h,i)-perylene and triphenylene in the plate incorporation method, and with fluoranthene in the bacterial fluctuation test. No mutagenic effects of benzo (b) fluoranthene towards any of the tested strains were detected. AA

- 1216 REHBEIN (H). Development of an enzymatic method to differentiate fresh and sea-frozen and thawed fish fillets. 1. Comparison of the applicability of some enzymes of fish muscle. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 263-5

The activities of mitochondrial and lysosomal enzymes in juices of fresh and frozen and thawed fillets were compared. It was demonstrated that several lysosomal enzymes are suitable for the detection of thawed fillets, because their activities in press juice increased considerably in consequence of freezing and thawing fish fillets. AA



## SARDINE

- 1217 SREENIVASIAH (PV), PRATHAPKUMAR (KS), RAMAPPA (BS) and BHANDARI (CS). Influence of residual fat in fish meal on broiler performance. *Indian Poult. Gaz.* 64(3); 1980; 75-8

Six sardine fish meal samples (sample 5 and 6 were extracted) stored over a period of one year and a commercial sample were incorporated in broiler diets at 10%. At end of 8 week experimental period, birds on commercial fish meal sample gained significantly more body weights than on experimental fish meal samples. Among the experimental fish meal samples, fish meal 5 containing 6% fat gave best results followed by unextracted sample with 23.4% fat. Residual fat content of fish meals and ME content of diets appeared not to have influenced the performance of broilers. The content and availability of amino acids in fish meals might have been responsible for varied responses of broiler chicks. AA

## TROUT

- 1218 STEFFENS (W). The edible portion in rainbow trout (*Salmo gairdneri*) of different sizes, and its chemical composition. *Nahrung.* 23(9-10); 1979; 935-41 (German)

The edible portion (muscle + skin) of 2 to 3 year old rainbow trouts, weighing 200-700 g amounts to more than 60%. The edible portion of the males is lower than that of the females, due to early gonad development. Bigger fish have higher contents of fats and dry substance. Fat content rarely exceeds 5% of the fresh material; protein content usually amounts to 19.5-20.0%. The amino acid composition of the protein has been reported. Rainbow trout weighing 200-300 g normally have a calorie content of 500-550 Kj (125 k cal) per 100 g. KMD

## HAKE

- 1219 LUPIN (HM), GIANNINI (DH), SOULE (CL), DAVIDOVICH (LA) and BOERI (RL). Storage life of chilled patagonian hake (*Merluccius hubbsi*). *J. Food Technol.* 15(3); 1980; 285-300

The storage life of iced Patagonian hake (*Merluccius hubbsi*) was studied. Seasonal changes were investigated by means of organoleptic assessments (raw and cooked), total volatile bases (TVB) and pH. During summer-time (December to March) the keeping time, from the edibility point of view, for round hake in ice is not more than 9 to 10 days in the remaining months the storage life under the same conditions is up to 14 to 15 days. The difference could be due to the biological condition of hake during and the after the spawning time (end of spring-beginning of summer), the shallow and temperate waters of the fishing grounds in summer, and the heavy feeding after spawning. AA

## SHRIMP

- 1220 WARREN (JP) and GRIFFIN (WL). Costs and returns trends in the gulf of Mexico shrimp industry. 1971-78 *Marine Fish. Rev.* 42(2); 1980; 1-7



## PROTEIN FOODS

- 1221 IMESON (AP), MITCHELL (JR) and LEDWARD (DA). Rheological properties of spinning dopes and spun fibres produced from plasma-alginate mixtures. *J. Food Technol.* 15(3); 1980; 319-27

## FRUIT JUICES AND BEVERAGES

- 1222 KUMAR (KR) and ANANDASWAMY (B). Packaging of processed beverages. *Packag. World.* 15(1/2); 1980; 10-4
- 1223 STRUEBI (P) and LODGE (N). The composition of fruit juices, drinks, beverages and nectars. *Food Technol. NZ.* 15(3); 1980; 13-9  
The article discusses about the fruit juices, drinks, beverages and nectars produced in New Zealand in relation to their prevailing regulations. KAR

### FRUIT JUICE

- 1224 EMCH (F). Fruit extraction and continuous fining. 5. Introduction to continuous fining. *Flussiges Obst.* 46(6); 1979; 216-8 (German)
- 1225 KORTH (A). From the business report of the association of the German fruit juice industry. *Flussiges Obst.* 46(7); 1979; 242-3 (German)
- 1226 WUCHERPFENNIG (K) and POSSMANN (PH). On the development of methods of juice extraction (or dejuicing). *Flussiges Obst.* 46(8); 1979; 282-9 (German)  
A first comparison shows that extracted juices may compare with the press juices when the necessary cellarage processing has been done. The possibility of making a second extraction with a band extractor has also been suggested. KMD

### STRAWBERRY

- 1227 CHEN (WP) and WROLSTAD (RE). A note on the influence of acetaldehyde on colour of strawberry juice. *J. Sci. Food Agric.* 31(7); 1980; 667-9  
Addition of acetaldehyde to strawberry juice caused an increase in colour density and decrease in anthocyanin content on storage. When both acetaldehyde and catechin were added, these changes were intensified. However, addition of catechin alone did not affect colour density. The results indicated that an increase in colour density required the simultaneous presence of anthocyanins, acetaldehyde and catechin. Big differences in colour measured by Hunger colorimeter were also obtained between strawberry juices with and without acetaldehyde. AA

### ORANGE

- 1228 'FRUIT JUICES AND FRUIT JUICE CONTAINING BEVERAGES'. Working group on Evaluation of juice quality of beverages having a low juice content. 1. Orange juice containing refreshing beverages. *Flussiges Obst.* 46(6); 1979; 206-11



As German law now requires that the percentage of fruit juice contained in a fruit beverage must be mentioned on the label, chemical analysts are now faced with the task of determining the fruit juice content of a fruit beverage. Hence, a sub-committee has been formed to ascertain what type of estimation could form a suitable basis for the determination of fruit juice content. KMD

- 1229 KOCH (J). On the free aminoacids in commercial orange juices. *Flussiges Obst*. 46(6); 1979; 212-6

36 samples of unadulterated, commercial orange juices from various (unknown) countries were analysed for their contents of free aminoacids. In the case of 10 aminoacids (arginine, alanine, glutamic acid, histidine, isoleucine, leucine, lysine, methionine, ornithine and serine) the values lay within the confidence limit  $\bar{x} \pm 2s$  in more than 50% of the samples. That is to say, the value obtained is valid for 95% of similar cases. The values for  $\gamma$ -aminobutyric acid, asparagine, aspartic acid, proline, threonine, tyrosine and valine do not fall within the same confidence limits. A normal distribution was not found in the case of glutamine, glycine and phenylalanine. The values reported in this paper must be considered only as preliminary data, and are not to be regarded as standard values. KMD

- 1230 MORESI (M) and SPINOSI (M). Engineering factors in the production of concentrated fruit juices. 1. Fluid physical properties of orange juices. *J. Food Technol.* 15(3); 1980; 265-76

This study presents the essential physical properties (boiling-point rise, viscosity, density, specific heat) of orange juices, necessary for the optimization of processing units for concentrated orange juices. When these physical properties were correlated with the sucrose content of juice, expressed as degrees Brix, in the range 10-65 Brix and compared with those of aqueous sucrose solutions, significant differences were observed in respect of viscosity, specific heat and elevation of boiling point. AA

- 1231 RICHARD (JP) and COURSIN (D). Application of methods from informatics to the examination of fruit juices: Application to orange juices. *Flussiges Obst*. 46(7); 1979; 263-73 (German)

The European legislation for fruit juices prohibits the standardization of fruit juices by changing them in order to comply with the standards, even though the latter are officially accepted. Thus, in certain circumstances, a natural orange juice may not contain enough sugar to comply with French standards for example, if it would not be treated in anyway it complies with legislation but not with the standards. If sugar is added to bring it into line with the standards it no longer complies with legislation. AA

#### SOFT DRINK

- 1232 JEURING (HJ), VAN DEN HOEVEN (W), VAN DOORNINCK (P) and TEN BROEKE (R). Rapid determination of quinine in soft drinks by reversed phase ion-pair chromatography. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 281-3

Quinine can easily be determined in soft drinks by means of reversed-phase ion-pair chromatography. Sample preparation is not necessary. Quinine is detected by fluorescence and UV spectrophotometry by continuous monitoring of the column effluent. A rectilinear response is obtained in the concentration range of 20-100 mg/l. The complete assay procedure takes about 8 minutes. AA



## CARBONATED

- 1233 WHITEAR (AL), CHANIN (CC) and PETERSON (J). A new instrumental method for measuring the carbon dioxide content of carbonated beverages. *J. Inst. Brew.* 86(5); 1980; 224-5

Tests of an instrument designed primarily for the estimation of carbon-dioxide in blood have demonstrated its suitability for carbon dioxide in carbonated beverages. In respect of speed, simplicity of operation, safety and reproducibility, the instrument's performance compares favourably with the Institute's recommended method. AA

## TEA

- 1234 DEV CHOUDHURY (MN) and BAJAJ (KL). Biochemical changes during withering of tea shoots. *Two and a Bud.* 27(1); 1980; 13-6

Aspects covered include: The biochemical changes taking place during withering of tea leaves include proteins; caffeine; sugars; organic acids; catechol oxidase activity; chlorophylls; phosphorous; volatile components; and permeability of cell membrane. The implications of these changes have been discussed. BSN

- 1235 DEV CHOUDHURY (MN) and BAJAJ (KL). Role of chlorophylls, amino acids and sugars in tea. *Two and a Bud.* 27(1); 1980; 16-20

Chlorophylls, amino acids and sugars of tea leaf undergo quantitative changes during manufacture. Chlorophylls are partially transformed to chlorophyllides during withering and to phenophytins and pheophorbides during fermentation and firing. Except theanine, all other amino acids significantly increased during withering. Theanine decreased due to its transformation to glutamic acid. During fermentation, aspartic acid and glutamic acid increased, while other amino acids declined significantly forming the corresponding aldehydes. Firing causes further decrease in the levels of amino acids. Leucines are partly metabolised to carotenes which are subsequently oxidised to linalool during processing of tea. Soluble sugars decreased during withering but showed slight increase during fermentation and firing due to breakdown of polysaccharides present in the leaf. During fermentation reducing sugars increased at the expense of non-reducing sugars. Higher phenophytin to pheophorbide ratio, higher phenylacetaldehyde and linalool contents and greater transformation of sugars appeared to contribute towards improvement of tea quality. AA

## COFFEE

- 1236 ANON. Second International Caffeine Workshop. *Nutr. Rev.* 38(5); 1980; 196-200

A brief resume of the workshop which discussed role of caffeine in neuropharmacology, kinetics and metabolism, behaviour, teratology, long term studies in animals, mutagenicity, fibrocystic breast diseases; and national toxicology program. BSN

- 1237 MOODY (GJ), ONG (B), QUINLAN (K), RIAH (AH) and THOMAS (JDR). The determination of fluorine in coffee and tea using a microprocessor coupled with a fluoride ion-selective electrode. *J. Food Technol.* 15(3); 1980; 335-43

The fluoride content of tea and coffee as normally brewed, and after Schoniger oxygen flask combustion has been determined with a fluoride ion-



selective electrode coupled to a microprocessor analyser in two of its operational modes. Up to forty samples per hour can be assayed in the CONCEN mode and the results compare favourably with the known addition (KA) back-up mode. AA

- 1238 RAHN (W), MEYER (H-W) and KONIG (WA). Effect of KVV-process on the composition of phenolic components of green and treated coffee. *Z. Lebensmittel-Unters. Forsch.* 169; 1979; 246-9 (German)

3,4-dihydroxy styrene (3,4-DHS) was identified as a main phenolic component in the condensate of green coffee treated by the special KVV-process. The treated green coffee contained 3-6 times higher concentrations of 3,4 DHS than the untreated coffee. The enrichment depended on coffee provenience. Quantitative investigations of ether-soluble constituents in an acidified coffee infusion (pH, 1,5) showed a significant diminution of catechol furfuryl alcohol and 4-ethylcatechol for steam treated coffee. These results indicate that chlorogenic acids are decomposed to 3,4-DHS during steam treatment of green coffee. Partly removal of this substance effects a reduction of the catechol concentration in the coffee beverage. AA

#### ALCOHOLIC BEVERAGE

- 1239 ETHIRAJ (S), SURESH (ER) and ONKARAYYA (H). Yeast flora associated with fermentation of mahua flowers. *J. Sci. Food Agric.* 31(6); 1980; 611-4

Nine morphologically different strains of yeasts were isolated from fresh, fermenting and fermented juice of mahua flowers and identified by both morphological and biochemical characteristics. The yeasts belonged to six genera namely, *Kloeckera* (*Kl. apiculata*), *Candida* (*C. krusei* and *C. tropicalis*), *Torulopsis* (*T. apicola* and *Torulopsis* sp.), *Pichia* (*P. terricola*), *Saccharomyces* (*S. chevalieri* and *S. cerevisiae*) and an unidentified genus. AA

#### WINE

- 1240 DEINHARDT (H). Technical developments in the German wine industry. *Food Technol. Aust.* 32(7); 1980; 351-3

#### BEER

- 1241 GARRICK (CC). Developments in the brewing industry. *Food Technol. Aust.* 32(7); 1980; 346-50

This has been covered under changes in raw materials, changes in processing including high gravity brewing, adjunct fermentation, and fermentation systems; characteristics of yeast and beer; metabolic by products of yeast; flocculation of yeast; yeast genetics; killer yeast and microbiological quality control. KAR

- 1242 HARRIS (JO). Single tank operation for fermentation and maturation. *J. Inst. Brew.* 86(5); 1980; 230-3

- 1243 HUDSON (JR). Analysis of hops and hop products of,  $\alpha$ -acids or Iso- $\alpha$ -acids. *J. Inst. Brew.* 86(5); 1980; 222-3

Reports two techniques based on the resolution of mixtures of hop compounds by chromatography on sephadex columns. The techniques have also been adopted by E.B.C. and A.S.B.C. as international methods. BSN



- 244 MARTIN (HL) and BAMFORTH (CW). The relationship between  $\beta$ -glucan solubilase, barley autolysis and malting potential. *J. Inst. Brew.* 86(5); 1980; 216-21
- 245 REEVES (SG), O'FARRELL (DD) and WAINWRIGHT (T). The effect of increased steeping temperature on malt properties. *J. Inst. Brew.* 86(5); 1980; 226-9  
Steeping barley at 30 C instead of 16 C can reduce malting time by 24 hours. The malts produced have normal analytical values but the mashes filter slowly and the malts would be expected to give poor wort separation in brewery. These run-off problems probably result mainly from starch-protein interactions. AA
- 246 SHARPE (FR), GRIMMETT (CM), LAWS (DRJ) and BETT (G). Preparation of hop extracts rich in particular constituents. *J. Inst. Brew.* 86(5); 1980; 234-41  
When a column containing powdered hops is extracted with liquid carbon-dioxide, chromatographic separation of hop components occurs. They are extracted in the order, essential oils,  $\beta$ -acids,  $\alpha$ -acids; and the separation is enhanced when finely milled hops are extracted. Early fractions ( $\sim 0.5$  hour) contain a high proportion of the available essential oils when hops are extracted at -20 C and such extracts are suitable as a replacement for dry hops. Fractions can be obtained from extractions at  $\sim 7$  C which are rich in  $\alpha$ -acids and contain low levels of  $\beta$ -acids. Small amounts of fats and waxes are normally present in fractions collected towards the end of a run when seeded hops are extracted. AA
- 247 SOPANEN (T), TAKKINEN (P), MIKOLA (J) and ENARI (T-M). Rate-limiting enzymes in the liberation of amino acids in mashing. *J. Inst. Brew.* 86(5); 1980; 211-5

## SHERRY WINE

- 248 ETIEVANT (P). Volatile constituents of a sherry wine (*Vin jaune du Jura*) identification of acetals arising from Glycerol. *Food Sci + Technol.* 12(2); 1979; 115-20 (French)  
Four compounds from a flor sherry wine (*vin jaune du Jura*) were isolated by chromatography on silica-gel and identified as 5-hydroxy 2-methyl 1,3-dioxannes cis et trans and 4-hydroxymethyl 2-methyl 1,3-dioxolannes cis and trans. For this purpose, mass, infrared and nuclear magnetic resonance spectrometry were used. These acetals are found to be natural products derived from glycerol and acetaldehyde and are odourless. AA

## OILS AND FATS

- 249 FINCKE (A). Possibilities and limitations of simple gas chromatographic analyses of triglycerides, to detect alien fats in cocoa butter and chocolate fats. I. Distribution of triglycerides, classified according to C-numbers, in cocoa butter. II. Distribution of triglycerides, classified according to C-numbers, in cocoa butter substitutes and other fats. III. Evaluation of gas-chromatographic analyses of triglycerides of cocoa butter. *Dtsch. Lebensmittel-Rundschau.* 76; (5), 162-7, (6), 187-92, (11) 384-9; 1980 (German)  
Determination of the fatty acid composition, by gas chromatographic estimation of the methyl esters of the fatty acids, failed to reveal adulteration of cocoa butter by small quantities (10%) of extraneous fats, and in one case even at 25% adulteration this was not revealed. Hence the author has tried to detect adulteration of cocoa butter by determining the triglyceride composition



of a fat, classified according to C-numbers. Consequently, the triglyceride compositions, classified according to C-numbers of cocoa butter and other fats e.g. sal fat, palm oil (middle fraction), fats of the 'illippe' group, sheasterin mango kernel fat, 'mowrah' fat, various vegetable oils and marine animal oils have reported. It has been found that the routine method and commercially available separation columns used for triglyceride analysis according to C-number do not give a useful separation according to the number of double bonds found in the triglycerides. Hence, it is always necessary to determine, by way of supplement, the fatty acid composition of the fat, and a few other estimations also, as occasion demands. KMD

- 1250 HUDSON (BJF) and MAHGOUB (SEO). Naturally-occurring antioxidants in leaf lipids. *J. Sci. Food Agric.* 31(7); 1980; 646-50

Lipids extracted from rye grass, broad beans and lucerne showed antioxidant properties. The phenolics which contribute to these properties and which are common among the three types of leaves are tocopherols, ferulic acid and quercetin. In model systems, quercetin is shown to be the most effective of these; but the effect is lesser than BHA, BHT and propyl gallate. KAR

- 1251 LAWRENCE (BM). New trends in essential oils. *Perfum. Flavor.* 5(4); 1980; 6-16

The review discusses briefly the future of flavouring ingredients, price comparisons, chemical composition of native spearmint oil, scotch spearmint oil, *Anethum* sowa Roxb oil, *Anethum graveolens* oil, *carum carvi* oil, sweet and bitter fennel oil, *Foeniculum vulgare* L oil, *Pimpinella anisum* L oil, *Coriandrum sativum* L oil and the nature of volatile constituents of a few of these oils. BSN

- 1252 LAWRENCE (BM). Progress in essential oils. *Perfum. Flavor.* 5(4); 1980; 29-35

- 1253 SCHUTZE (I) and MULLER (W). Determination of trace elements in dietary fats and emulsifiers by means of flame-less atomic absorption spectrometry (AAS). Part II. Determination of mercury in dietary fats and emulsifiers. *Nahrung.* 23(9-10); 1979; 867-74 (German)

The experimental conditions required for the digestion and the cold steam AAS of samples of emulsifiers and dietary fats have been indicated. The accuracy of the procedure was 10 ng Hg for 1% absorption, and the recovery rate was 96% for a mercury content of 0.2 µg; the relative average error was calculated as 11%. Mercury levels in various fats and oils - sunflowerseed, linseed, rapeseed, olive and fish were found to range between 0.02 and 0.04 mg/kg. KMD

## SPICES AND CONDIMENTS

- 1254 HEANEY (RK) and FENWICK (GR). The analysis of glucosinolates in *Brassica* species using gas chromatography. Direct determination of the thiocyanate ion precursors, glucobrassicin and neoglucobrassicin. *J. Sci. Food Agric.* 31(6); 1980; 593-9

Both glucobrassicin and neoglucosinolates are separated using gas chromatography and summation of the contents of these indole compounds agrees well with the figure arrived at by the conventional thiocyanate release method. Glucosinabin is also well separated from glucobrassicin and neoglucobrassicin and all three may be separated and quantified. KAR



- 5 WEBER (FE). Controlling microorganisms in spices. *Cereal Food World*. 25(6); 1980; 319-21

Microbial characteristics of spices and control of fumigation by the use of ethylene oxide and the method of application along with the regulatory aspects for the use of ethylene oxide have been covered. KAR

## SENSORY EVALUATION

- 56 POKORNY (J), DVORAKOVA (L), MARCIN (A), BULANTOVA (H) and DAVINER (J). Sensory profiles of reaction products between aminoacids and D-fructose on D-arabino-hexosulose. *Nahrung*. 23(9-10); 1979; 921-7

Different aminoacids and their mixtures were heated with D-arabino-hexosulose or D-fructose to 100-130 C. The aroma produced had three principle characteristics; (i) roasted, burnt, or caramel aroma, mostly in mixtures containing D-fructose; (ii) flowery, fruity, sweet and heavy odour notes, mainly in mixtures with D-arabino-hexosulose, and (iii) sour, slightly penetrating odour notes. Strecker decomposition obviously plays a important part in formation of aroma in the course of the Maillard reaction. Other reactions, which contribute to the formation of the caramel-like or roasted aroma, also occur. KMD

## INFESTATION CONTROL AND PESTICIDES

- 57 CHANDRATRE (MT) and GUPTA (VP). Insecticides act. Its enforcement and implementation in Maharashtra. *Pesticides*. 14(9); 1980; 3-7

## BIOCHEMISTRY AND NUTRITION

- 58 ANON. Dietary fiber, exercise and selected blood lipid constituents. *Nutr. Rev.* 38(6); 1980; 207-9

- 59 ATWAL (AS), ESKIN (NAM) and VAISEY-GENSER (M). Note on the estimation of choline in plant protein sources. *Cereal Chem.* 57(5); 1980; 368-70

- 60 DELUCA (HF). Some new concepts emanating from a study of the metabolism and function of vitamin D. *Nutr. Rev.* 38(5); 1980; 169-82

- 61 KUCHER (E). A territorial model for the secondary prevention of obesity. *Ernährungsforschung*. 24(1); 1979; 20-3 (German)

- 62 LOCK (S) and BENDER (AE). Measurement of chemically-available iron in foods by incubation with human gastric juice *in vitro*. *Br. J. Nutr.* 43(3); 1980; 413-20

The results obtained with human gastric juice differed from those obtained with *in vitro* methods i.e. treatment with HCl an double incubation with pepsin plus HCl at pH 2.5 followed by adjustment to pH 7.5. The amount of Fe liberated from soyabean flour with pepsin HCl was much greater than that known to be absorbed by man *in vivo*. KAR



- 1263 ULBRICHT (G) and RAKE (I). Working-day and week-end nutrition of normal and obese subjects. *Ernährungsforschung*. 24(1); 1979; 26-9 (German)
- 1264 ULBRICHT (G), RAKE (I) and MOHR (M). Methodological bases of the nutritional-physiological assessment of the per capita consumption of foods. Part II. Nutritional-physiological assessment of the per capita consumption. *Nahrung*. 23(9-10); 1979; 899-913 (German)

The per capita consumption of various items has been evaluated from the nutritional-physiological stand point, and the average energy and nutrients supply of the total population were calculated and compared with the recommended daily allowances. The nutritional status of the (E. German) population has been globally assessed. A reduction in calorie and fat consumption seems desirable; it can be promoted by a better supply of calorie reduced products. Further food modifications, e.g. in the form of proteins, vitamin and mineral fortifications are not necessary for the average population. KMD

## TOXICOLOGY AND HYGIENE

- 1265 AUERMANN (E), DASSLER (H-G), CUMBROWSKI (J), KNEUER (M), JACOBI (J) and KUHN (H). Cadmium content of plant foods in the effective range of a lead smelting plant. *Nahrung*. 23(9-10); 1979; 875-90 (German)

Within the range of contamination of a lead smelting plant, the Cd-content of the soil was 70-230 times the normal, and the Cd-content of fruits and vegetables 2.85 times as high as the normal. The mean Cd-contents observed in vegetables were 0.4-25.5 ppm, and in fruits 0.09-1.17 ppm. The Cd concentrations found in soil samples were 6.8-22.8 ppm, and in drinking water 0.009 ppm; in the atmosphere and sedimentary dust 0.007 mg/m<sup>3</sup> and 0.550 mg/m<sup>2</sup>/30d. were found respectively. The total human uptake in this territory was found to be 3.3-32.6 µg/d. The following Cd levels were found in human organ samples obtained at necropsy: right and left renal cortex 33.99 and 35.98 ppm respectively; liver 3.14 ppm; lungs 0.63 ppm; pancreas 1.47 ppm; brain stem 0.16 ppm. KMD

- 1266 BILMANIS (MK) and DENNY (CB). Recovery of viable *Staphylococcus aureus* in corn and green beans stored at ambient temperature. *J. Food Prot.* 42(4); 1979; 310-11
- 1267 CARLBORG (FW). Cancer mathematical models and aflatoxin. *Food Cosmet. Toxicol.* 17(2); 1979; 159-66
- 1268 COHEN (AJ). Critical review of the toxicology of coumarin with special reference to interspecies differences in metabolism and hepatotoxic response and their significance to man. *Food Cosmet. Toxicol.* 17(3); 1979; 277-89
- 1269 FLOWERS (RS) and ORDAL (JZ). Current methods to detect stressed *Staphylococci*. *J. Food Prot.* 42(2); 1979; 362-7
- 1270 HARTMAN (PA). Modification of conventional methods for recovery of injured coliforms and salmonellae. *J. Food Prot.* 42(4); 1979; 356-61
- 1271 KOCIBA (RJ), KEYES (DG), LISOWE (RW), KALNINS (RP), DITTENBER (DD), WADE (CE), GORZINSKI (SJ), MAHLE (NH) and SCHWETZ (BA). Results of a two-year chronic toxicity and oncogenic study of rats ingesting diets containing 2,4,5,-trichlorophenoxyacetic acid (2,4,5,-T). *Food Cosmet. Toxicol.* 17(3); 1979; 205-21



This study revealed no oncogenic response in rats, even when the duration of 2,4,5-T administration extended over most of their lifespan at a dosage high enough to induce toxicity. AA

- 1272 KRIEK (NPJ) and MARASAS (WFO). Toxicity of *Diplodia macrospora* to laboratory animals. *Food Cosmet Toxicol.* 17(3); 1979; 233-6

The toxicity of *Diplodia macrospora* isolated from Zambian white maize to ducklings and rats is described. Pure cultures of *D. macrospora* on autoclaved maize were acutely toxic and caused the death of four out of four rats within 7 days and four out of four ducklings with 5 days. Dietary levels as low as 2% mouldy meal caused significant reduction in weight gain of male and female rats compared to the controls. Pulmonary haemorrhage, alveolar, septal and perivascular oedema of the lung, mild cholangitis and a mild renal tubular nephrosis were the most important histological changes. Systemic shock, possibly related to a direct endothelial toxicity, appeared to be the main cause of death. AA

- 1273 LOMPE (A) and MILCZEWSKI (K-E). A cell-culture assay for the detection of mycotoxins: 1. Investigations with pure toxins. 2. *Lebensmittel-Unters. Forsch.* 169; 1979; 249-54 (German)

For the detection of mycotoxins by abiological assay, cells were seeded in microtiter-plates together with toxin. After 24 h and 6 days of culture, cells were examined visually for cytotoxic effects, growth inhibition and morphological aberrations. Three human and 2 porcine cell lines were compared as to their reaction with 16 mycotoxins and 9 organic chemicals. The results indicate that the toxin activating systems differ with type and origin of cells. This suggests the use of several selected cell-lines in parallel for testing of microbially derived food additives for possible contamination by mycotoxins. AA

- 1274 PONCELET (F), ROBERFROID (M), MERCIER (M) and LEDERER (J). Absence of mutagenic activity in *Salmonella typhimurium* of some impurities found in saccharin. *Food Cosmet. Toxicol.* 17(3); 1979; 229-31

o-Sulphobenzoic acid, o-toluenesulphonamide and ammonium o-sulphobenzoate were assayed for their possible mutagenicity in several *Salmonella typhimurium* strains. No mutagenic activity was detected towards any strain, at any of the levels tested, either in the absence or presence of fortified rat liver post-mitochondrial fractions. AA

- 1275 POWERS (EM) and LATT (TG). Rapid enumeration and identification of stressed fecal coliforms. *J. Food Prot.* 42(4); 1979; 342-5

- 1276 REISS (J). Inhibitory action of the mycotoxins patulin and penicillic acid on urease. *Food Cosmet. Toxicol.* 17(2); 1979; 145-6

Patulin and penicillic acid inhibited the activity of the enzyme urease. The inhibitory action was reduced by addition of cysteine, suggesting that the toxin-enzyme interaction was due to blocking of essential thiol groups in the enzyme molecule. The lowest concentrations of patulin and penicillic acid found to have an inhibitory effect on the urease preparation tested were  $1.7 \times 10^{-5}$  M and  $1.1 \times 10^{-5}$  M, respectively. AA

- 1277 ROWLEY (DB), VANDERMARK (P), JOHNSON (D) and SHATTUCK (E). Resuscitation of stressed fecal coliforms and their subsequent detection by radiometric and impedance techniques. *J. Food Prot.* 42(4); 1979; 335-41



- 1278 SHREEVE (BJ), PATTERSON (DSP) and ROBERTS (BA). The 'carry-over' of aflatoxin, ochratoxin and zearalenone from naturally contaminated feed to tissues, urine and milk of dairy cows. *Food Cosmet. Toxicol.* 17(2); 1979; 151-2

Concentrate rations containing 385-1925  $\mu\text{g}$  zearalenone/kg or 317-1125  $\mu\text{g}$  ochratoxin A/kg were prepared from naturally contaminated cereals and were each fed to two adult cows. Residues of zearalenone, ochratoxin and aflatoxin B<sub>1</sub> were not detected in muscle, liver, kidney, serum, milk or urine, but ochratoxin A was detected in the kidneys of one cow at a concentration of about 5  $\mu\text{g}/\text{kg}$  and aflatoxin M<sub>1</sub> was detected in the kidneys, milk and urine of all animals at concentrations varying from trace amounts to 0-6  $\mu\text{g}/\text{kg}$ . AA

- 1279 TAYLOR (SL) and LIEBER (ER). *In vitro* inhibition of rat intestinal histamine-metabolizing enzymes. *Food Cosmet Toxicol.* 17(3); 1979; 237-40

- 1280 UNGER (PD), SIRAJ (MY) and HAYES (AW). *In vitro* metabolism of (<sup>-14</sup>C) rubratoxin B by rat hepatic subcellular fractions. *Food Cosmet. Toxicol.* 17(2); 1979; 111-6

- 1281 UNTERMANN (F). Bacterial food-intoxication with steeped whole meal products. *Getreide Mehl. Brot.* 33(11); 1979; 294-5 (German)

Experiments were conducted on the increase of staphylococci in the steeped whole meal products, which led to the following conclusions. The time between preparation and consumption of a foodstuff should be as short as possible. In the case of examined products, the steeping of grains should be done in refrigerator or the steeping time should be reduced to a maximum of three hours. Such measures are important as they not only reduce the danger of bacterial intoxication but also the risk of bacterial food poisoning to a minimum. KMD



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